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STEMMING THE TIDE: THE U.S. RESPONSE TO TSUNAMI GENERATED MARINE DEBRIS

HEARING

BEFORE THE

SUBCOMMITTEE ON OCEANS, ATMOSPHERE,
FISHERIES, AND COAST GUARD

OF THE

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

MAY 17, 2012

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ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

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STEMMING THE TIDE: THE U.S. RESPONSE TO TSUNAMI GENERATED MARINE DEBRIS

THURSDAY, MAY 17, 2012

U.S. SENATE,
SUBCOMMITTEE ON OCEANS, ATMOSPHERE, FISHERIES,
AND COAST GUARD,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Subcommittee met, pursuant to notice, at 10:31 a.m. in room SR-253, Russell Senate Office Building, Hon. Mark Begich, Chairman of the Subcommittee, presiding.

OPENING STATEMENT OF HON. MARK BEGICH, U.S. SENATOR FROM ALASKA

Senator BEGICH. We will call the meeting to order. This is the Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard.

Today's hearing is on stemming the tide of U.S. response to tsunami-generated marine debris.

We thank the witnesses for being here. Welcome to we think an important hearing on the marine debris headed to the West Coast from the Japanese tragedy and its long-term implications.

We welcome David M. Kennedy, Assistant Administrator of NOAA's National Ocean Service. We also welcome Rear Admiral Cari Thomas, Director of Response Policy for the United States Coast Guard. Thank you both for being here this morning.

The earthquake and tsunami which struck northern Japan just over a year ago was an unprecedented human tragedy. In minutes, it claimed thousands of lives, destroyed complete communities, and touched off the failure of nuclear power plants. The tsunami also left a legacy which our West Coast states, thousands of miles from the epicenter, are dealing with now and will deal with for many years to come.

Marine debris is nothing new. Flotsam and jetsam has existed for centuries, made worse by the proliferation of plastics which do not degrade. To some, like beachcombers who find occasional messages in the bottle, it is a delight, but to others it is an eyesore or worse. Many now recognize marine debris as a threat to fish, marine mammals and seabirds, through death by entanglement and ingestion.

The tsunami unleashed debris on an unprecedented scale. Some 5 million tons were swept out to sea. While most quickly sank, NOAA estimates 1.5 million tons of tsunami-generated debris is still afloat and being driven by winds and currents toward the West Coast of North America. That is 3 billion pounds of mostly

plastic trash which will flood into our inter-tidal ecosystems and it is already here.

We have read the press reports of soccer balls found on Middleton Island in my state and the fishing floats and Styrofoam insulation washing up on Kayak and Montague Islands. These are mostly the high windage items which float high in the water and are pushed by wind.

Then there is the ghost squid boat that appeared off the south-east panhandle and was promptly sunk by the Coast Guard. And I want to thank you, Admiral, for doing that.

And even the Harley Davidson, which washed up in British Columbia.

From Alaska to Washington, the reports of tsunami debris are coming in, including reports of containers of hazardous materials such as oil and solvents. That is not surprising when you consider that entire cities with their gas stations, garages, warehouse, stores, and industrial plants all washed into the sea and are now becoming a threat to our shores.

One of my constituents, Chris Pallister of the Gulf of Alaska Keeper, has worked on marine debris issues for most of the last decade. He described the tsunami debris as a slow motion environmental disaster that will far exceed any single pollution event to hit the West Coast of North America, including the Exxon Valdez and the Santa Barbara oil spills.

I am submitting Pallister's letter for the record and one from the Juneau-based Marine Conservation Alliance Foundation, which has helped coordinate marine debris efforts in Alaska for years.

[The letters referred to follow:]

May 2, 2012

Subject: Japanese tsunami debris disaster in the Gulf of Alaska

Senator Mark Begich
United States Senate
111 Russell Senate Office Building

Re: Japanese tsunami debris cleanup response.

Honorable Senator Begich:

Thank you for your effort to generate a response to the Japanese tsunami-generated marine-debris catastrophe. Gulf of Alaska Keeper (GoAK) is a non-profit whose primary mission is combatting the marine debris (MD) issue in the northern Gulf of Alaska (GOA). We work on the problem full time and maintain a highly trained and competent cleanup crew. We have worked closely with NOAA on cleanup projects the last 6 years and MCAF the last 7. MD is our business.

Very few people recognize and appreciate the scale of the environmental disaster that is about to befoul the western United States coastline, particularly Alaska's. In addition to all the plastic and other solid debris, not many realize that millions of containers of hazardous material are coming our way. When you consider that entire cities with all their garages, auto stations, shops, warehouses, stores, industrial plants and everything in between washed into the sea, you begin to understand how many containers of chemicals went afloat. Most of those that did not rupture immediately, and most assuredly didn't, will survive their Pacific transit and will wash upon our high-energy shores. If they are not immediately removed, they will spill their contents in sensitive inter-tidal ecosystems. Over time, plastic debris will be UV degraded and pounded into tiny particles by our high-energy beaches. When that happens, plastic toxins will then be mobilized into the food chain, potentially harming everything in its path for generations.

What we see unfolding is a slow-motion environmental disaster that will far exceed any single pollution event to hit the west coast of North American, including the Exxon Valdez and Santa Barbara oil spills. This is not exaggeration or hyperbole. Tens of thousands of miles of shoreline will ultimately be impacted by this event. Beaches from California to the Aleutians will be littered. Furthermore, unlike

spilled crude, over time degraded plastic can become more dangerous to the environment, not less so. In addition to the billions of pounds of plastic debris, all which contains inherent toxic chemicals, millions of containers of hazardous chemicals are about to hit our sensitive shorelines. GoAK has warned repeatedly of the potential tsunami debris toxic impact and nobody appeared to listen—or at least no one that could make plans or act quickly. From the evidence we gathered this past week, the toxic spill is already occurring. This event has the potential to significantly damage fish and wildlife, and commercial, subsistence, and recreational resources for generations. We must act now. It does no good to ask people or agencies why they haven't already acted or why they don't have a plan of action in place. Instead, we must drive home how serious this matter is and must ask what we can do to help prepare for this disaster.

At our own initiative and cost, GoAK surveyed northern Gulf of Alaska beaches from Cape Suckling east of Kayak Island west to the southern end of Montague Island. As you may have seen on the national news Monday evening, a staggering amount of tsunami debris has already landed on our beaches. Immediately upon determining that an environmental disaster was unfolding, we contacted the Coast Guard, the Alaska Department of Environmental Conservation, NOAA and the press. On Friday we accompanied the press to Kayak Island and on Saturday went with ADEC, NOAA and the Coast Guard to survey Montague, Hinchinbrook and Egg Islands. The amount of broken pieces and bits of Styrofoam blue board, white board, and urethane spray-in foam insulation from crushed buildings that litter the beach is nearly beyond comprehension. What we witnessed is truly startling and many magnitudes worse than anything I have ever seen . . . and marine debris is my life.

Senator, nobody has more on-the-ground MD experience than Gulf of Alaska Keeper. We have been cleaning some of the dirtiest beaches in the United States for over ten years. I have personally surveyed allegedly dirty beaches in the Chesapeake Bay area, in the Florida Keys, in Hawaii, and Alaska. Alaska, unfortunately, wins the prize with the dirtiest beaches. Even more unfortunately, the northern Gulf of Alaska is the worst. We have closely studied this matter and presented at the Fifth International Marine Debris Conference in March, 2011, describing exactly how the tsunami debris would end up in Alaska.

Nothing we've seen to date surprises us. The prevailing winds, coastal currents, deep ocean currents, tides and prevailing winter storm tracks all conspire to rip debris out of the Pacific and drive it straight into the gut of the GOA. Then, geography and topography set the final trap. If you look at the GOA on a map, you will realize that it is an inverted funnel; with the help of the prevailing winds and the Alaska Coastal current, immense amounts of debris are driven onto northern GOA beaches, such as those along Kayak and Montague Island, numerous islands within Prince William Sound, the Kenai Peninsula GOA coast, the Barren Islands, and the Kodiak Island archipelago. Topography then comes into play with the region's rocky, log-littered, brush-covered beaches, efficiently trapping any debris. The rest of the GOA coast from Southeast Alaska to the Aleutians will also be significantly impacted.

NOAA's latest estimate is that 1.5 million tons of tsunami-generated debris will hit the west coast of North America. That translates into 30 billion pounds. If only 1 percent of that reaches Alaska's shores, 30 million pounds of largely plastic and toxic debris will flood our sensitive inter-tidal ecosystem. We predict that Alaska will receive closer to 25 percent, or more, of the debris over a period of many years. The cost to remove it from our remote, inaccessible, and often dangerous beaches will be high. The plastic debris, particularly all the nearly infinite pieces of Styrofoam bits and millions of larger Styrofoam pieces, will be an incredible challenge to remove. However, of possibly greater immediate concern is all of the chemical waste floating onto our beaches. By law, and for obvious safety reasons, the millions of containers of hazardous chemicals destined for our coast cannot be removed by just anybody. A person must be HAZMAT certified to handle, transport or dispose of hazardous material. Much of what comes ashore will be initially unidentifiable because the labels will be gone or because of the language barrier. A properly trained person must deal with these materials. Can you imagine the scope of doing that in Alaska? The ADEC and the United States Coast Guard have told Gulf of Alaska Keeper that our cleanup crew must be HAZMAT certified which we will complete next week. It will be a time-consuming and expensive proposition to properly train and certify thousands of cleanup workers along the western United States. We need to get started before millions of pounds of hazardous material are improperly and illegally handled.

We are not suggesting that a military type industrial response to this pollution event is the proper approach for cleaning it up. The nature of the spill requires a long-term, economically-sustainable, and environmentally-friendly response. The

tsunami debris will wash up on our beaches for years. Alaska has already been hit by the first wave of fast-traveling material such as thousands of buoys, Styrofoam of every imaginable type, 50-gallon drums, fuel cans and every type of empty or nearly empty container imaginable. The fuller, heavier containers will arrive later. That means most of the toxic chemicals are not yet here; how much later until their arrival is anybody's guess.

Our suggestions for responding to this environmental disaster are fairly straight forward. We have great faith in NOAA's Marine Debris Division. They have the necessary expertise and management skills to lead the response. However, they are seriously underfunded. Instead of the current proposed budget cut, NOAA's marine-debris budget should be substantially increased. Given the scope and the long-term duration of this environmental tragedy, we seriously recommend that NOAA immediately be given \$200,000,000 to fund their marine debris grant program. Yes, that is 200 million dollars, to, used over 4 years. Given the geographic scope of this disaster and the expected long-term influx of tsunami-generated debris, this cleanup response will undeniably be a very expensive and lengthy proposition.

We further recommend that NOAA disburse the money to qualified cleanup groups in the form of competitive matching grants. Because this is not necessarily only a Federal problem—state and private land will also be impacted, we further suggest that all of the grants require a 2 to 1 match, 1 part state and 1 part non-governmental. The non-governmental grant match could be comprised of private and corporate donations and in-kind contributions. Leveraging the funds in such a way will make the money go much further in these times of lean budgets. Furthermore, competitive grants will weed out the waste and inefficiencies associated with massive industrial-style responses. We believe an economically-sustainable, environmental-friendly, long-term cleanup response can be designed and is possible now using these ideas.

Senator, we understand that you are calling for hearings on the lack of agency response to this massive environmental issue. We believe we have much to add to this conversation in the form of hard-earned experience and expertise. Nobody knows more about marine debris issues in the northern GOA. We would be pleased to participate in any hearings or help in any other way you may deem beneficial. We sincerely thank you for your interest and hard work on this issue. We look forward to hearing from you.

Please review goak.org for more information on our organization and projects.

From the front lines, sincerely,

CHRIS PALLISTER,
President,
 Gulf of Alaska Keeper.

Originally, landfall for tsunami debris was projected to occur in early 2013. However, it did not take into account the unexpectedly large amount of "high windage" type of debris. This type of debris moves much more quickly than debris confined to the currents. Recent reports from our monitoring program and from members of the Alaska public indicate that debris is coming ashore across the entire Gulf of Alaska in incredibly large volumes.

The period for work is short along the Gulf of Alaska coast. Realistically, crews will not be able to work safely and effectively after mid-September. We ask that you establish a program with a minimum of \$25 million to begin removing tsunami debris this summer. While we acknowledge this amount of funding is more than what has been established for marine debris in the past, our extensive experience in this field would indicate this is the level of funding necessary to tackle this problem. The time window is short, the volume of material appears extraordinary, and the result of inaction would appear to be a large scale environmental problem.

Thank you for your consideration and please know that we are willing to assist you in any way.

Sincerely,



Merrick Burden
Executive Director

cc:

Senator Olympia Snowe
Senator Daniel Inouye
Senator Roger Wicker
Senator John Kerry
Senator Johnny Isakson
Senator Bill Nelson
Senator John Boozman
Senator Maria Cantwell
Senator Marco Rubio
Senator Frank Lautenberg
Senator Kelly Ayotte
Senator Amy Klobuchar
Senator Dean Heller
Senator Mark Warner

Senator BEGICH. Since the event, NOAA's Marine Debris Program has closely monitored the incoming tides of debris. They have modeled drift patterns and tracked reports as they come in. I know NOAA has further plans to monitor this problem, but my constituents, to be very honest with you, are asking with this debris already here, what is the plan? And how are we going to deal with this and how are we going to clean it up? In some cases, some think it is a little late. And not just this summer, but over the years, this debris will be arriving to our shores.

That is the purpose of today's hearing: given this clear threat, what is our national plan to stem the tide of the tsunami debris?

And while I have heard the debris carries no threat of radiation since it went out to sea before the reactor failures, I want to ask what you know about the possible threat and monitoring done to date because it is a concern to many.

But I want to emphasize the point before I call on the ranking member and then the Senator from Washington, we had a hearing

probably 2 months–3 months ago. This issue came up and we were told things are—I do not want to say under control, but we are monitoring it carefully. But every time I go back to Alaska, I hear over and over and over again of large sightings, and there are photos here of some of the debris that is starting to wash up and it is growing rapidly. And it almost seems like there is a “well, let us just see what happens” plan. And that is not acceptable.

Today at 7 a.m. Alaska time, the Copper River opening will occur, which means literally 6 hours later when that incredible fish gets caught—the salmon—it will be in the Washington ports for market. It is the first fish out and the highly prized Copper River salmon. So we fear what the impact may be.

So we are anxious to hear not about what you are seeing today but what are the plans, what are the efforts aggressively to deal with this issue as it continues to move forward.

Let me have the Ranking Member, Senator Snowe, make her comments.

**STATEMENT OF HON. OLYMPIA J. SNOWE,
U.S. SENATOR FROM MAINE**

Senator SNOWE. I thank you, Mr. Chairman, for convening this hearing today to discuss this very important topic, marine debris resulting from last year’s devastating earthquake and tsunami in Japan. And I think it is important to provide this kind of attention and focus on this critical issue.

On March 11, 2011, the island nation was struck by a 9.0 magnitude earthquake causing a tsunami that resulted in tremendous devastation, as we all know, killing nearly 16,000 people, with an additional 3,000 still missing and presumed dead. Over 200 square miles were inundated. Some waves traveled more than 6 miles inland, reaching a maximum height of over 100 feet in some places. Entire communities were washed to sea.

This disaster was far worse than what had previously been considered the worst case scenario. And Japan should be commended for their effort they put into place in preparing for such a disaster. Despite the tremendous loss of lives, countless people were saved by advanced preparation. Forty percent of Japan’s coast was protected by sea walls and prompt warning of a major tsunami allowed time for many to evacuate.

But the height of the tsunami was greater than thought possible. In many cases, sea walls, built to hold the sea at bay, were breached and washed away. Tragically at least 101 designated evacuation sites were flooded and people who followed the evacuation orders and thought they had reached safety in time still perished. The devastation resulting from this horrific event demonstrates we can always do better to prepare.

The heartbreaking job of cleaning up and rebuilding from the tsunami still continues in Japan and is estimated to cost more than \$34 billion, making this the most costly natural disaster in history. With some communities simply gone, it is not always clear how the rebuilding should begin.

Five million tons of debris were swept into the ocean as a result of the tsunami, much of this staying just offshore, but some of it, as much as 1.5 million tons, continue to float and was carried out

to sea by the winds and currents. This debris includes boats, household goods, children's toys, everything from infrastructure to personal possessions.

The first items to arrive in our waters were high-windage items, those items that float high enough in the water to be primarily blown by the wind. A recently updated model from NOAA that includes actual wind and current conditions from the past year suggests that tsunami debris likely began to arrive in the winter of 2011 to 2012. The first confirmed debris from the tsunami was identified on March 20 this year when a 160-foot fishing boat was spotted off the coast of Canada. Recognizing that this ship posed a navigational hazard to mariners, the Coast Guard sank it 17 days later.

We do not actually know how much more debris is coming our way, nor do we know what will wash ashore. Low windage items that are primarily moved by the ocean currents will take longer to reach our Pacific coastline. It will be years before we will know the extent of the debris. This will add to the already substantial burden that marine debris places on our oceans.

Along with my West Coast colleagues whose states are now being directly impacted by this event, I have long supported work that addresses the effects of marine debris on the health of our oceans. Most recently last year, I cosponsored Senator Inouye's Trash-Free Sea Act to reauthorize NOAA's marine debris program and direct the agency to develop a plan on how best to respond to marine debris from the tsunamis, floods, landslides, and hurricanes.

And yet, despite the ongoing problem of marine debris and the expected increase in marine debris from the Japanese tsunami, the President's budget request proposed a reduction in funding to this program. I am pleased that the Senate mark recognizes the importance of the Marine Debris Program and would increase its funding by \$400,000 for Fiscal Year 2013, providing the resources necessary to continue tracking and addressing the impact of the tsunami debris.

I look forward to hearing from our witnesses today learning more about this topic.

David Kennedy, I appreciate the excellent job that you and your staff have conducted at the National Ocean Services and keeping us up to date regarding the status of debris from the tsunami.

Admiral Thomas, the Coast Guard is our first line of defense against this wave of debris coming toward our shores. I am eager to hear more about the Coast Guard's plans in addressing this very consequential issue that has potentially safety and navigational hazards posed of a serious nature by the tsunami debris.

Thank you, Mr. Chairman.

Senator BEGICH. Thank you very much.

And let me turn to Senator Cantwell, and then we will start with the hearing.

**STATEMENT OF HON. MARIA CANTWELL,
U.S. SENATOR FROM WASHINGTON**

Senator CANTWELL. Thank you, Mr. Chairman. And I want to thank you and the Ranking Member for holding this important hearing and, Mr. Chairman, for your continued focus on this.

I would say Washington and Alaska, Oregon, and California, Hawaii are all very united in our concern over the economic impacts that tsunami debris can have to our region. Our state, Washington State's coastal economy produces \$10.8 billion in economic activity and it supports over 165,000 jobs. So anything that threatens that coastal economy is something we are going to pay a lot of attention to.

So we are here today to talk about how we are going to get a response from NOAA on what is this threat, the measurement of the threat, and what the response plan is to that threat.

A few short weeks ago, we just marked the 1-year anniversary of the devastating tsunami in Japan, and the people of Washington State, because of our connection with Japan, have a great sense of loss. We remember those people who have lost their lives. Seeing that devastation when the waters rolled back and we saw what happened shocked many people, not just in America but around the world. And so it has become very clear to us what unbelievable economic damage can happen and what can be at risk.

So for our commercial and recreational fishing and our vessel construction of ships, our tourism, our thriving ecosystem, we all want to know what the plan is.

So, Mr. Chairman, I feel like you do, that we are not getting the answers that we need.

I would like to submit a statement from the Mayor of the City of Long Beach. He reflects a unique and staggering concern about what tsunami debris can do to his community, and he wants to know what the plan is.

[The statement follows:]

WRITTEN STATEMENT OF ROBERT E. ANDREW, MAYOR,
CITY OF LONG BEACH, WASHINGTON

Introduction

Chairman Rockefeller, Ranking Member Hutchinson, and distinguished Members of the Committee, thank you for allowing me to share my thoughts with you on this issue. This is written as though it were testimony before the Committee.

I am the Mayor of Long Beach, a small coastal town of about 1,400 hardy citizens located at the most southwest corner of the great state of Washington. It is where the mighty Columbia River meets the Pacific Ocean, and it is a wild and scenic place, where the historic ways of making a living from land and sea still provide for our families. The ocean and bays are a part of the working landscape of our economy—crabbing and fishing in the ocean, and shellfishing for clams and oysters in nearby Willapa Bay.

This rugged place is not for everyone—winters are cold and wet, and we frequently experience hurricanes. We are home to landmarks with picturesque and dark names such as Dismal Nitch, Cape Disappointment, and the Graveyard of the Pacific. The Columbia River bar is one of the most treacherous stretches of water on Earth, and nearby the Coast Guard maintains Station Cape Disappointment—which responds to 300 to 400 calls each year—as well as its renowned National Motor Lifeboat School, which is a rough water training facility.

Why would anyone live here you may wonder—because we are truly blessed with an abundance of nature. It is not unusual to see eagles soaring, deer or elk grazing by the roadside, or a mother bear with cubs. Everyone fishes and digs razor clams for fun AND for dinner. Cranberries and blueberries grow easily in our climate, and it is a treat to see these fields butt up against natural forested land. The eight-plus mile Discovery Trail will take you from dune to forest to beach, and you can explore both of our lighthouses. But the “main event” is our beach. The Long Beach Peninsula is a finger-like sandbar running north-south parallel to the coast, with narrow Willapa Bay between the peninsula and the mainland. This peninsula is an accreted sandbar, created by sediments that travel down the Columbia River, then drift

northward and settle. The most distinctive feature of the Long Beach Peninsula is 28 breathtaking miles of unobstructed sandy beach.

So you can imagine that we value our beach. And you can probably imagine that we worry about the possible effects that debris from the March 2011 Tohoku tsunami that occurred off the coast of Japan might do to our beach, as well as to our historic fisheries.

Background

On March 11, 2011, a magnitude 9.0 undersea mega-thrust earthquake occurred approximately 43 miles east of the Tōhoku coast of Japan. It was the most powerful earthquake ever known to have struck Japan, and one of the five most powerful earthquakes in the world since modern record-keeping began. The earthquake triggered a multi-wave tsunami that reached heights of up to 133 feet, and which travelled up to 6 miles inland.

This earthquake-tsunami event resulted in the deaths of nearly 16,000 people, with an additional 27,000 injured and 3,200 missing. Severe damage occurred—more than 129,000 buildings totally collapsed, and a further 946,000 buildings were damaged. The event also caused extensive and severe structural damage in north-eastern Japan, including heavy damage to roads and railways, and a dam collapse. A total of 319 fishing ports were damaged in the disaster, and utilities were destroyed. A vast quantity of debris from this event—estimated at 5 million metric tons—was swept into the Pacific Ocean on the retreating tsunami waves.

Debris Problems and Issues Facing a Small Washington Town

What does this all mean to a small coastal Washington town? Our concerns are likely representative of the Columbia-Pacific region if not the entire coast, and include fisheries, tourism, and maritime navigation.

Fisheries. Fishing is both a recreational and commercial way of life in our part of the world. At the southern end of the Long Beach Peninsula, our neighbor Ilwaco is a port village that is home to commercial and charter fishing fleets. Jessie's seafood processing facility perches on the Ilwaco waterfront, has been in business in the region since the 1940s and in Ilwaco since the 1960s, and employs an average of 110 FTEs. Salmon, sturgeon, halibut and other bottom fish, tuna, and crab support this historic fishery. Due to fish population changes and attendant regulatory changes, these fisheries have been hard hit in the past 50 years. Now our fishermen range further than ever before to make a living, some fishing in Alaska for part of the year. Should tsunami debris damage northwest fish and crab populations, we may well face the complete loss of our regional fisheries. While I am sure the living landscape of our shoreline and shallow waters will recover, I am not sure they will recover in time to maintain these historic fisheries. This would be a major blow to our economy, our communities, and a sad loss of a hard-working way of life that has survived two centuries. If our fisheries are affected, it is critical that regional fishers be kept going financially until the environment can recover.

Tourism. Long Beach and the peninsula on which it is located are largely supported by tourism. In fact, more than 45 percent of the homes in Long Beach are vacation homes. The wintertime population of the Long Beach Peninsula is around 10,000 people, but in the summertime residents and visitors number around 30,000. From July through September we hope to see our hotels full, as well as our restaurants and shops. All of this economic activity is due to the beach—visitors and summer residents come for the beach first, and then explore and enjoy the rest of the area. Since the global economic downturn, we have had our local downturn as well. The result of tsunami debris on our beach with respect to tourism is uncertain. I will be honest, if the debris is fairly light and not dangerous it might capture the imagination of the public and could be the best thing that ever happened to us. It would be a treasure hunt every day. We had 4 dead whales on our beach in two months this winter, and it was unbelievable how many people turned out in the wind and rain to take a peek. But on a more serious note, if the debris is heavy or dangerous, it could keep the visitors and summer residents we are so dependent on away. And THAT would be disastrous for our economy, and for the 230 small businesses located in Long Beach that are the engine of that economy.

Maritime Navigation. The Columbia River connects the Pacific Ocean to the upstream Ports of Portland, Vancouver, Kalama, Longview, Rainier, and Astoria, as well as several smaller ports. More than 40 million metric tons a year are transported via the Columbia River shipping channel. So, it is a critical and major element in the west coast maritime industry. In addition, tens of thousands of small charter boats and very small personal recreational fishing craft traverse the river near its mouth as well as the nearby Pacific Ocean. Should tsunami debris hamper the mouth of the Columbia, it could affect shipping, resulting in a major negative

economic loss to the region. More importantly, it has the potential to pose a hazard to smaller vessels, risking human safety.

In summary, my three main concerns for our local area and region relate to fisheries, tourism, and maritime navigation. If all three were negatively affected, it would in essence be a “triple whammy” on our local and regional economies. In combination with the general downturn in the economy, an uncoordinated or unmanaged response to this debris event is a blow that Long Beach and the Columbia-Pacific region cannot endure.

Tsunami Debris Modeling, Predictions, and What We Can Understand from Them

Several entities have modeled the path of the Japanese tsunami debris. Modeling conducted just after the event in April 2011 by The International Pacific Research Center predicted that debris would reach our coastline three years after the event, in 2014. In February of this year, the same group more or less reconfirmed their model stating that tsunami debris will not reach our coastline for another year or two, 2013 or 2014.

NOAA's original models predicted that debris, if it arrived at all, would make west coast landfall in 2013. At that time, NOAA's worst-case scenario was for large concentrations or heavy objects to wash ashore and the agency's best-case scenario was for debris to break up and disburse, never making landfall, or that only a tiny fraction would make landfall. Taken as a whole, those predictions were not very useful.

More recent NOAA modeling takes into account that buoyant materials will be wind-driven and less buoyant materials will be current-driven. That model recognizes that wind-driven debris has already made landfall and will continue to do, and that debris may or may not be followed by current-driven debris. This more recent model reflects anecdotal information from British Columbia and Alaska, local beachcombers, and local beach clean-up volunteers. However, this model still does not tell us about the quality or quantity of debris that may reach our shores.

So, what can we understand from all of this? It seems that we must plan for every possible outcome, or narrow down the possible outcomes by getting better information.

Getting Better Information

Modeling is based on assumptions, and educated as they might be they are still assumptions. So, where can we find better information? Well, there is nothing like a picture to tell a story. I attended several meetings on the Long Beach Peninsula that included state and Federal representatives. One of their concerns on the tsunami debris issue was that information was lacking entirely or was of insufficient quality. In particular, these folks felt the resolution of satellite imagery available to them was too low to be of much use. If satellite imagery of a higher resolution were available, say from military satellites, then useful information about the debris and its path could be obtained. I don't know about security clearances, but I am hoping you can find a way to use more sophisticated equipment that already exists to develop the higher resolution information. Using this more accurate information could lead to a far more accurate and efficient plan of action.

Getting Procedures and a Program in Place

Whether or not we have better information, procedures for communication and action as well as a chain of authority and responsibility need to be established, and I believe they need to be put in place quickly. This month we read articles in the Alaskan press of debris on the beach with no plan to pick it up and cries of “Shame on us for not being prepared.” We have had a year to get prepared, and Washington too will have few excuses when the day comes.

While we in government can quickly establish a network of communication, it does not seem to have happened. We have received some phone numbers and an e-mail address, but that hardly constitutes a plan. The public will naturally call 9-1-1 if they find debris on the beach that puzzles or frightens them. What do our dispatchers tell them, and to whom do they relay the public's concerns? What if a personal item is found—how might it be restored to its rightful owner? What if a barrel or other potentially hazardous item is found? Can ANY item be legally taken off the beach under these circumstances? And the \$64,000 question: When and if debris starts to pile up on or beaches or interferes with maritime navigation, who is going to pick it up and where will they take it? The City of Long Beach itself has literally one dump truck—we are too small and woefully under-budgeted to address a moderate to heavy debris event. Yet we want to and will certainly do our part.

I urge you to plan for this tsunami-related debris event, and to plan for it occurring this year. With limited funding in this economic environment a well-developed plan and well-coordinated program will be the most effective and efficient solution for dealing with what might be a major threat to the west coast. If we fail to protect our natural and working landscapes or our people, we have failed as government. We are small, but want to be part of the solution, and we look to your leadership to define a plan of action. Long Beach—and I believe the Columbia-Pacific region—stands ready to do our part. There is much at stake.

Thank you for the opportunity to share my thoughts with you.

Senator CANTWELL. Mr. Chairman, we also had in this just last few weeks an incident in Washington State where a crabber vessel was sunk, and now oil leaking from that vessel is threatening the shellfish industry in our state. So it does not take a lot to imagine what would happen if the response plan is just “we will sink it.” We need something much more elaborate to understand and stop this debris before it actually reaches our shores. That is what we want to see, and that is what we are hoping to get from a response plan today.

It is very important that the resources are there to mobilize the emergency research funds from the RAPID program, the National Science Foundation RAPID program, which would give scientists the tools that they need to analyze and to tell us about this likely debris and where it will go and what areas it will impact.

We also want to make sure that this science is available to other scientists in the Northwest. It is almost as if there is an attitude that the tsunami debris is top secret and we cannot get the information. It should not be this way. The information and data, the best-guess scenario should be available to everyone and all communities so that they can plan.

We would hope that once that information is made available, that that would be part of an action plan that then could be implemented by the Coast Guard, by NOAA, but certainly would give those communities the sense that they can plan for what this likely impact could be. We know that not every plan is going to be carried out in the detail that was originally proposed, but having no plan or not understanding what the plan is or just counseling people individually does not give the people of Washington State the certainty and predictability that they would like to see. Many people said we would not see any of this impact until 2013 or 2014, and now ships and motor cycle and this various debris are showing up and people want answers.

So, Mr. Chairman, I look forward to the witnesses being here today. I know that they play a role and it is not all on their shoulders. But certainly this Senator is going to continue to push until NOAA responds in the appropriate way of giving our coastal communities the answers that they deserve.

I thank the Chairman.

Senator BEGICH. Thank you very much.

Let me first start with our first witness, Mr. David Kennedy, Assistant Administrator, National Ocean Service, National Oceanic and Atmospheric Administration, otherwise known as NOAA. Please.

**STATEMENT OF DAVID M. KENNEDY, ASSISTANT
ADMINISTRATOR, OCEAN SERVICES AND COASTAL ZONE
MANAGEMENT, NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE**

Mr. KENNEDY. Thank you. Chairman Begich and members of the Subcommittee, thank you for the opportunity to testify on the NOAA Marine Debris Program and its activities to address the marine debris generated by last year's devastating Japan tsunami.

NOAA is very concerned and is taking the active steps to address the threat tsunami debris poses to our coastal communities and natural resources. We are leading efforts with Federal, State, and local partners to collect data, assess the debris, and reduce possible impacts.

I would like to give you some background on the Marine Debris Program, which is the Federal Government's lead on marine debris issues, and highlight a few examples of how NOAA is responding.

The NOAA Marine Debris Program is small, but it has a big impact on a big problem. The world's oceans and shores are plagued by manmade debris that causes untold economic losses to coastal communities and threatens wildlife, habitat, human health, safety, and navigation. The program of 13 staff conducts activities to research, prevent, and reduce marine debris and its impacts. In addition to its robust science, outreach, and education components, the program also spends a significant portion of its budget supporting long-term community-based removal projects. These projects benefit coastal habitats and waterways, but they are not rapid response. The program, which sits within NOAA's Office of Response and Restoration, has historically received approximately \$4 million in annual appropriations. Regional coordinators located throughout the country provide support to these projects and lend expertise to marine debris stakeholders in coastal states and territories.

As Chair of the Interagency Marine Debris Coordinating Committee, NOAA continually works in partnership across Federal agencies to ensure coordination on national and international marine debris efforts.

Since the disaster struck Japan, NOAA's activities, led by the Marine Debris Program have focused on understanding the scope of the threat to our coasts from tsunami-generated debris. NOAA quickly mobilized after the disaster to share the latest information on the threat, and we are continuing to collect data on the debris quantity and type, as well as location and movement. At the same time, we are coordinating heavily with State and local response agencies to share information and draft response plans that will help reduce impacts to communities, natural resources, and navigation.

The Government of Japan, as has been referenced here before, estimated that the tsunami swept 5 million tons of debris into the ocean and that 1.5 million tons of that floated. It is unclear how much of it and what types survived a year at sea, but we expect that it could be buoyant items such as floats, lumber, plastic containers, and vessels. Radiation experts assure us it is highly unlikely any debris is radioactive, but there is a possibility that hazardous items such as oil drums will wash ashore.

The potential area where debris may have drifted in the north Pacific Ocean is vast, equaling a space roughly three times the size of the contiguous United States. In order to locate significant concentrations or large items, we are gathering data from multiple at-sea sources, including ocean-going vessels, aircraft, and satellites. Our models, which have given us an understanding of where debris may be located today, help focus our detection and response decisions. NOAA has asked groups who regularly have eyes on the water to report sightings, including fleets from partner Federal agencies, commercial fishing and shipping vessels, scientific expeditions, and recreational pilots.

The U.S. Coast Guard reports any sightings logged during regular enforcement overflight missions, and in some cases, they have conducted overflights with NOAA representatives on board to help identify debris.

We also continue to receive and analyze high resolution satellite imagery from the National Geospatial Intelligence Agency to find debris in targeted areas where our models suggest it may be located. We will continue to use sophisticated detection technologies as they become available to us.

NOAA is also acquiring baseline information on marine debris that is currently stranded on U.S. coastlines in advance of the possible influx of tsunami debris. Changes in volume and type of debris may be the only indication that tsunami debris has arrived. So NOAA plans to conduct marine debris surveys in all impacted areas for the next 2 years. In order to gain a more complete picture of where debris is showing up, we also have established an e-mail address where anyone, including the general public, may report sightings.

Debris removal will likely fall to the states in most cases, and with tight budgets, it is necessary to ensure that removal plans make the best use of existing resources. NOAA is coordinating with State and local agencies to create contingency plans for a range of scenarios which will include rapid response protocols. Workshops have already taken place in Hawaii and Washington State, and the results will help guide workshops planned for Alaska, Oregon, and California.

NOAA will continue to pursue on-the-ground research, prevention, and reduction of marine debris nationwide and leverage every resource available to address debris from the Japanese tsunami. However, comprehensively responding to the tsunami debris will take substantial resources. Emergency trust funds do exist, but currently there is not a fund for marine debris hazard response on this scale. So it is critical that we continue to have a complete engagement at every level, Federal, State, and local. It will not be possible for NOAA to coordinate a debris response without each State's participation.

NOAA is committed to protecting our communities and trust resources for the impact of debris and looks forward to working with the Committee to achieve this outcome.

I would also like to thank the Committee for its attention to the marine debris problem and for its continued efforts to reauthorize the NOAA Marine Debris Program.

Thanks. I am willing, of course, to take questions.

[The prepared statement of Mr. Kennedy follows:]

PREPARED STATEMENT OF DAVID M. KENNEDY, ASSISTANT ADMINISTRATOR, OCEAN SERVICES AND COASTAL ZONE MANAGEMENT, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Introduction

Mr. Chairman and members of the Subcommittee, thank you for this opportunity to testify on the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program (MDP) and its activities surrounding marine debris generated by the devastating Japan tsunami. My name is David Kennedy, Assistant Administrator for the National Ocean Service at the Department of Commerce's NOAA.

NOAA is concerned about the threat this debris poses to our coastal economies and natural resources, and we are leading efforts with federal, state, and local partners to collect data, assess the debris, and reduce possible impacts. I would like to take this opportunity to give you some background on the program and what it does, as well as highlight the ways NOAA is working to assess and respond to the tsunami debris.

Marine Debris Impacts

Marine Debris is currently defined for the purpose of the Marine Debris Research, Prevention, and Reduction Act as, "any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes." Marine debris, which can be anything from lost or abandoned fishing gear and vessels, to plastics of any size, to glass, metal, and rubber, is an on-going international problem that impacts our natural resources. In addition to being an eyesore, it can threaten oceans, coasts, wildlife, human health, safety, and navigation. Every year, unknown numbers of marine animals are injured or die because of entanglement in or ingestion of marine debris. It can scour, break, smother, or otherwise damage important marine habitat, such as coral reefs. Many of these habitats serve as the basis of marine ecosystems and are critical to the survival of many important species. Derelict fishing gear can also cost fishermen untold economic losses. For example, crab pots and nets can continue to capture fish—something we refer to as "ghost fishing"—for years after they're lost or abandoned, depleting fisheries and reducing abundance and reproductive capacity of the stock. In addition to the ecosystem impacts, coastal communities collectively spend millions of dollars annually trying to prevent debris from washing up on their shorelines and trying to remove it once it does wash up. It not only degrades our coasts' natural beauty, but it threatens the safety of those who work and play there.

Marine debris can also present a navigation hazard to vessels of any type. Ropes, plastics, derelict fishing gear, and other objects can get entangled in vessel propellers and cause operational problems and large items such as lost containers can actually be collision dangers. Plastic bags can clog and block water intakes and are a common cause of burned-out water pumps in recreational crafts. Such incidents involve costly engine repairs and disablement. These dangerous and costly impacts are problems for both the recreational boating and commercial shipping communities, and NOAA's MDP is actively seeking partnerships within these communities to expand our area of knowledge and begin to proactively address the dangers.

Abandoned vessels along the Coasts and waterways are another type of marine debris posing a threat to marine resources and navigational safety in our waterways. Because older or inoperable vessels are expensive to remove and become even more costly the longer they are left in place, owners sometimes leave such vessels on the shoreline or sunk close to shore after removing identifying numbers. With the economic downturn, many states are finding abandoned vessels to be a serious marine debris problem.

In addition to improving navigation safety, addressing marine debris reduces the risks of entanglement and trapping of marine species, as well as risks to human health, and it promotes vital marine habitat recovery.

The NOAA Marine Debris Program in 2012

The NOAA MDP supports national and international efforts to research, prevent, and reduce the impacts of marine debris. Its activities are mandated by the 2006 Marine Debris Research, Prevention, and Reduction Act. Since then, the program has been a leader on marine debris issues, and continually works in partnership with local and state agencies, other Federal agencies, nongovernmental organizations, academia, private industry, and the interested public to identify and address key marine debris issues.

The program, which is currently supported by 13 staff, conducts research, prevention, and reduction projects and outreach and education activities, which are implemented by NOAA directly or through grants, contracts, and cooperative agreements. Regional coordinators in several locations around the country act as a resource for local marine debris stakeholders, and work to manage, support, and coordinate marine debris activities.

The program is currently focused regionally with coordinators leading marine debris efforts in the Pacific Islands, Alaska, West Coast, Gulf of Mexico and Caribbean, East Coast, and Great Lakes. Since 2005, the program has funded over 212 projects, and held 14 regional, national, and international workshops and meetings.

As the lead Federal agency addressing marine debris and Chair of the Inter-agency Marine Debris Coordinating Committee, NOAA continually works in partnership across Federal agencies to ensure coordination in its national and international marine debris efforts.

The NOAA Marine Debris Program received \$4.6 million in FY 2012 to address and respond to marine debris and plans to use these funds for several activities over the coming year. Those activities include debris removal from the Northwestern Hawaiian Islands, improved at-sea observations, coastal monitoring, contingency planning, and model improvement. In accordance with direction given in the Senate Appropriations Committee Report on the Department of Commerce's FY 2012 appropriations (112-78), NOAA will continue to coordinate and integrate habitat conservation and coastal restoration activities, including the Marine Debris Program, within the agency in order to streamline efforts and find administrative efficiencies.

Research

Marine debris is a relatively new research field, and there are many opportunities to advance understanding of how debris impacts the environment. Over the past several years, the NOAA MDP has focused on microplastics research, developing standardized methodologies for monitoring marine debris on shorelines and in coastal surface waters, and assessing derelict fishing gear impacts throughout the country.

The program also supports studies that close gaps in understanding. For example, in 2005 and 2007, the program funded a crab pot survey project in the Chesapeake Bay that ultimately helped form the Commonwealth of Virginia's crab recovery program.

The program developed a strategy to guide coordination of holistic, efficient, and impactful research projects through 2016, focusing on the abundance and behavior of debris in the marine environment, and investigation into the chemical, biological, and socio-economic impacts of debris on marine and coastal ecosystems. The strategy provides a framework for engaging in complementary research and planning to best address the risks of marine debris to marine systems by prioritizing the most urgent gaps in research. The knowledge gained through these projects will help focus prevention and reduction efforts on the areas of greatest concern.

Prevention

One of the best ways to reduce marine debris is through prevention, and that requires that boaters, fishermen, industry, and the general public have the knowledge and training to change behaviors that create marine debris.

The NOAA Marine Debris Program's robust outreach and education activities focus on improving awareness and changing behavior through developing and disseminating public information, and by partnering with external groups to expand its reach. For example, the program partners with the U.S. Coast Guard to educate boaters about at-sea garbage dumping regulations. Other partners include the Legacy Foundation, with whom NOAA raises awareness on cigarette butt litter, and the Ocean Conservancy, with whom we partner on digital outreach and awareness. The materials and partnership products are all free and downloadable from the NOAA MDP website, and the program's regional coordinators do extensive boots-on-the-ground outreach year-round.

The program also works to educate children on the marine debris problem. It has developed and provided marine debris curriculum to schools across the country, facilitated a popular elementary and middle school art contest, and is now pursuing outreach techniques to better reach high school students.

Reduction

Since its inception in 2005, the NOAA MDP has been actively involved in marine debris abatement projects on the East and West Coasts, Hawaii, Alaska, and the Gulf Coast and Great Lakes regions. A significant portion of the program's budget goes toward supporting removal, including locally driven, community-based marine

debris prevention and removal projects that benefit coastal habitat, waterways, and wildlife including migratory fish.

For example, in Washington State, the program supported the Northwest Straits Marine Conservation Initiative in its effort to survey for, assess the impact of, and remove derelict fishing gear in Puget Sound, resulting in the removal of thousands of derelict fishing nets and crab pots. Similarly, in 2007 NOAA supported the St. Lawrence Tribe of Indians in surveying for crab pots using side scan sonar, and removing derelict crab pots deeper than the reach of divers with a remotely operated vehicle.

In Alaska's Prince William Sound, NOAA partnered with the Gulf of Alaska Keeper Foundation to remove debris from remote shorelines both inside the Sound and on the outer coast in order to prevent the re-mobilization of debris that can threaten marine species through entanglement and ingestion and help to restore valuable coastal habitat. In many areas, this removal has been paired with annual returns to the same beaches to monitor how much and how quickly debris accumulates.

The program also engages in many partnerships across the country, which often focus on removal, as well as education and outreach. One important example of a successful strategic partnership is the Fishing for Energy program. Launched in 2008 through a partnership among Covanta Energy Corporation, the National Fish and Wildlife Foundation, NOAA, and Schnitzer Steel Industries, Inc., the partnership works closely with state and local agencies, community and fishing groups, and local ports to install bins at convenient and strategic locations into which fishermen can deposit fishing gear. When these bins fill up, the gear is collected and transported to a nearby Schnitzer Steel facility where the metal (*e.g.*, crab pots, gear rigging) is pulled for recycling, and rope or nets are sheared for easier disposal. Then the waste is brought to the nearest Covanta Energy-from-Waste facility, where the gear is converted into renewable electricity for local communities.

Regional Coordination

Working with non-governmental organizations, academia, regional organizations, local, state and Federal governments, and international organizations is a priority for the NOAA MDP. NOAA's marine debris regional coordinators extensively cover marine debris issues in the Pacific Islands, West Coast, Alaska, Great Lakes, East Coast, and Gulf of Mexico. While these coordinators focus on the local, state, and regional issues as a part of the national program, they are also able to bring in lessons learned and make connections across the country and the world. NOAA has held lead roles in developing marine debris plans for Hawaii and the West Coast Governors Alliance on Ocean Health, planned multiple workshops for New England, the Great Lakes, Alaska, and Hawaii, and worked on specific projects throughout all regions. NOAA continues to work with partners throughout the country to develop and test innovative and cost-effective methods of detection and removal of marine debris, and to engage the public and industry, including shippers and fishermen, and the recreational community on marine debris.

Marine Debris and the 2011 Japan Tsunami

Marine debris typically originates from both land-based and ocean-based sources, but coastal storms and natural disasters are another source of marine debris creating hazards on our inland and coastal waters. For example, as a result of the tragic tsunami that struck Japan last year, NOAA anticipated debris that washed into the ocean would gradually reach U.S. and Canadian shores. In addition to the incredible human tragedy of the earthquake and tsunami, part of its aftermath has resulted in concern over marine debris that directly impacts our coasts.

NOAA's MDP has been focused on this issue since the day of the tsunami. The Government of Japan estimated that the tsunami swept 5 million tons of debris into the Pacific Ocean, and that 70 percent sank right away near the coast of Japan, leaving an estimated 1.5 million tons floating. The debris quickly dispersed out of the large "debris fields" that were observed in the days following the disaster, and after a few weeks, it could no longer be located with low-resolution satellite.

Now, more than a year later, it is likely that some debris has broken apart, weathered, or sank. NOAA's models show that the area where debris may have dispersed is equal to roughly three times the size of the contiguous United States. While it is difficult to tell exactly what types of debris are still floating or how much, it is believed that buoyant debris such as fishing gear, lumber from destroyed buildings, consumer plastics and styrofoam, rubber and other materials, oil and chemical drums, and possibly vessels may still be floating. The MDP is working to understand the scope of the threat, and is collecting data on debris quantity and type, location and movement, and impact.

At-Sea Detection

In order to understand where the debris is located today and where it may wash up on shorelines, NOAA modeled the debris' path using a model that responders have previously used during oil spills. This gave NOAA an understanding of where debris from the tsunami may be located today, because we were able to simulate how winds and ocean currents from the past year may have moved items through the Pacific Ocean. We are updating this model regularly with new data, and exploring other modeling options through collaborations with university and Cooperative Institute modelers, as well as a subject matter expert group that includes modelers from across NOAA and the University of Hawaii. For example, in FY 2012, NOAA plans to leverage existing partnerships at the University of Washington to develop a model that will provide more accurate estimates of debris concentration at or just beneath the ocean's surface.

Given model limitations and the large potential area of debris drift in the vast North Pacific Ocean, NOAA is working in other ways to ensure the public and local communities have the best information on the debris' location and types. To that end, NOAA is using ocean-going vessels, aircraft, and satellites to gather additional data.

NOAA has coordinated with groups who regularly have "eyes on the water," to report back debris sightings, including shipping fleets, commercial fishing vessels, and scientific fleets such as University-National Oceanographic Laboratory System vessels. The U.S. Coast Guard also reports any sightings logged during regular enforcement over-flight missions, and NOAA has asked recreational pilots to do the same through the Federal Aviation Administration. NOAA established an e-mail address, DisasterDebris@noaa.gov, where any sightings at sea or from the general public on shore may be reported, and those sightings are entered into a tracking database.

NOAA is working to acquire high-resolution satellite imagery of targeted areas in the North Pacific Ocean through NASA and the National Geospatial Intelligence Agency, so that we can inform our models and gather more information about how much debris is still floating. The Department of Defense has also offered its input on satellite imagery.

NOAA will continue to make sightings data available to our response agency partners and the public through maps, graphics, and other visualizations of debris in the water and on shorelines. The information is available on NOAA's Environmental Response Management Application (ERMA). ERMA was a successful vehicle for making data available to the public during the *Deepwater Horizon* oil spill response.

In FY 2012, NOAA is also pursuing additional at-sea detection technologies to gather more information about the debris. Proposals are in the works to deploy drifter buoys in concentrations of marine debris or other strategic areas of interest, which will help NOAA refine its marine debris fate and transport modeling. Ship-based Unmanned Aircraft System surveys, will also be conducted from opportunistic cruises to help detect Japan tsunami marine debris at-sea in open North Pacific waters.

Coastal Monitoring

Leveraging local knowledge of the shorelines and near-shore landscape is also important, since the only indications that marine debris specifically from the Japan tsunami is making landfall in a region may be changes in the quantity or the composition of debris compared to what is observed normally. NOAA is acquiring baseline information on the marine debris that is currently stranded on U.S. coastlines in advance of potential influx of tsunami debris. Using NOAA's standardized shoreline monitoring protocols, baseline marine debris surveys will be conducted in Alaska, California, Oregon, the main Hawaiian Islands, and Washington for a two-year period. Shoreline monitoring with the U.S. Fish and Wildlife Service on the Northwestern Hawaiian Islands is well underway.

NOAA will also extend activities on four to five existing shoreline monitoring sites within the Gulf of Alaska. Additionally, marine debris data will be collected on shore during planned ship-based surveys of the outer coast of South East Alaska from Dixon Entrance to Yakutat. Drop-camera searches will also be conducted opportunistically for derelict fishing net aggregations at snag points near-shore.

Results of the monitoring will help indicate when and where Japan tsunami marine debris is making landfall. NOAA Marine Debris staff will work with state and local partners from government agencies and non-governmental organizations (NGOs) to conduct shoreline monitoring of marine debris using standardized shoreline monitoring protocols. A side benefit of this project is development of monitoring partnerships that will facilitate future data collection and community engagement.

Contingency Planning

Since we do not expect the debris' impact or the response to those impacts to be the same in every state, NOAA is working with federal, state and local agencies to create regional contingency plans, which will include rapid response protocols. Ideally, each region or state will have specific protocols based on its response structure and available resources.

The NOAA MDP held contingency planning workshops in Hawaii and Washington State, which each included representation from about 50 Federal and state agencies, counties, tribes, NGOs and industry. The results will help guide workshops planned for Alaska, Oregon, and California.

Communication and Coordination

NOAA meets with multiple state and Federal agencies on a regular basis to coordinate on tsunami marine debris response and to exchange information and external messaging. Federal partners include the U.S. EPA, U.S. Coast Guard, Navy, Department of State, U.S. Fish and Wildlife Service, and the National Park Service. The Interagency Marine Debris Coordinating Committee, chaired by NOAA, receives regular updates on the situation and has discussed how to best leverage capabilities without duplicating efforts.

NOAA's regional coordinators are working with local representatives from these agencies in AK, CA, HI, OR, and WA, and are also working directly with state and local agencies, as well as the Government of British Columbia, to ensure they receive and share the most current information. The MDP's coordinators have participated in or led nearly 100 meetings, briefings, or public town halls on this issue in impacted regions since October.

In addition to regular meetings, the MDP hosts biweekly calls to present the latest information and status update on the situation. The call list includes over 125 individuals and is open to all interested state and Federal agencies from Midway to Alaska, including those in Canada.

NOAA, along with the Department of State, has also been in regular contact with the Government of Japan, Kyoto University, and Japan consulates in Hawaii, Alaska, and U.S. West Coast states. NOAA and the Government of Japan have agreed to exchange information on research, modeling, and data collection, and NOAA staff is working with consulates on protocols for returning any sensitive items found back to Japan.

Media and public interest in this issue is high, and in order to provide the best information to a widespread audience, MDP staff has given dozens of interviews to nearly 100 different national and local media outlets. We have continually updated our NOAA MDP website with the latest information on the tsunami, providing Frequently Asked Questions and access to our latest model visualizations. Our state partners have also collaborated on a federal-state joint information center website to provide a "one-stop shop" to the public for regional information. It includes access to fact-sheets, pictures, and guidelines for reporting debris.

Cleanup plans in regions where debris could potentially make landfall and responsibility for implementing them will vary significantly depending on what types of debris arrive and where. As part of NOAA's contingency planning process, we will use existing response protocols to help states determine which responder would have jurisdiction in a range of scenarios. For example, if a HAZMAT item washed up on state-owned land, the responder would be different than if consumer plastics washed up in a National Park.

However, in order to make sure contingency plans are efficient, comprehensive, and useable, NOAA needs complete engagement during the planning process from state agencies, which are best equipped to make decisions about who can handle debris and what resources are available for removal. In most cases, decisions to remove debris will likely fall to the states, and it is necessary to ensure that the contingency plans help make the best use of existing resources. Contingency planning is already well underway in Hawaii and Washington, but the process has yet to start in Oregon, California, and Alaska.

Conclusion

Marine debris is a problem we can, for the most part, prevent. The NOAA MDP will continue to pursue on-the-ground research, prevention, and reduction of marine debris nationwide, and leverage every resource available to address problematic debris from the Japan tsunami. While the problem of marine debris has existed for decades, there is still much to learn as we work to address the impacts of marine debris to the environment and marine species. Additional research is needed to understand and assess the impacts of marine debris on diverse species and habitats as well as the economic impacts and the dangers to navigation posed by marine de-

bris. NOAA is committed to minimizing the impact of marine debris, and looks forward to working with the Committee to achieve this outcome.

Senator BEGICH. Thank you very much. We will start with the questions in just a moment.

Rear Admiral Cari Thomas, Director of Response Policy for the U.S. Coast Guard.

**STATEMENT OF REAR ADMIRAL CARI B. THOMAS, ASSISTANT
COMMANDANT, RESPONSE POLICY, U.S. COAST GUARD**

Admiral THOMAS. Good morning. Chairman Begich, Ranking Member Snowe, Senator Cantwell, I am Cari Thomas and delighted to be here, part of the U.S. Coast Guard.

I am pleased to have this opportunity to discuss with you the service's roles and authorities it applies to protect the U.S. waters, shorelines, and exclusive economic zone from the potential impacts of the marine debris created by the devastating 2011 Japan tsunami.

Being responsible for response policy, my duties include overseeing incident management policies. In carrying out those duties, I draw upon my 14 different assignments where I was involved with several types of incidents, including hurricanes, ship groundings, airplane crashes, mass migrations, and hundreds of search and rescue cases, some of which included marine debris.

Today I will provide an overview of Coast Guard efforts related to marine debris, delineate the Coast Guard's role in supporting NOAA and the interagency and provide some operational examples that reinforce the principles of preparedness and the need for advance planning to address the challenges caused by marine debris.

As discussed by Mr. Kennedy, NOAA is the lead agency for conducting research, monitoring, prevention, and reduction activities for marine debris. NOAA's Marine Debris Program leads this effort and NOAA chairs the Interagency Marine Debris Coordinating Committee. The Coast Guard supports NOAA by participating as a member of that committee.

The Marine Debris Research, Prevention and Reduction Act of 2006 identifies the Coast Guard as an agency that NOAA should coordinate with to address marine debris issues. To date, the Coast Guard has been fully engaged with NOAA in support of marine debris monitoring and tracking to ensure the safe navigation of shipping and to protect the marine environment.

Coast Guard actions in support of NOAA depend on the type of debris. The Coast Guard, as the Federal on-scene coordinator for the coastal zone, will lead removal actions under the National Contingency Plan for any debris that poses a threat via potential oil or hazardous substance to the environment.

The Coast Guard may also develop and issue broadcast notice to mariners and advise vessel traffic of potential hazards to navigation. The service also has the authority to destroy these hazards for navigation to sea to make sure that we are protecting lives and preserving property.

If debris creates a hazard to navigation in navigable waters or channels, the Coast Guard typically works with the Army Corps of Engineers, the lead Federal agency for all obstructions determined

to be in federally-maintained navigable channels or waterway to address the matter.

Coast Guard resources and personnel may also be requested by NOAA to help with identifying, tracking, and monitoring debris by conducting overflights such as those conducted over Montague Island with NOAA representatives on board.

The Coast Guard and NOAA actively work and plan together at all levels at both agencies.

At the national level, the Coast Guard participates in bi-weekly interagency conference calls hosted by NOAA to provide strategic interagency coordination, awareness, and information-sharing. At the regional and local level, with the Coast Guard Pacific area, the 13th district, the 14th district, and the 17th district are all actively engaged with all partners.

The Coast Guard and NOAA recently coordinated 10 interagency public meetings in Oregon to provide information on agency authorities and capabilities. Similar meetings are planned for Hawaii and California in coming months. We also participated in an interagency marine debris workshop in Washington State to support Washington State's drafting of a marine debris contingency plan.

The Coast Guard's recent sinking of the derelict fishing vessel provides an excellent example of how we use our authorities and assets to address the challenges associated with marine debris. Several weeks ago, the service began tracking that fishing vessel, which was originally sighted by the Canadian Coast Guard. Our airplane crews deployed data marker buoys and conducted daily overflights to track the vessel. We used this information to notify mariners of the vessel's position via broadcast notice to mariners.

The derelict vessel's projected path would take it near the approaches to Dixon Entrance, a waterway where approximately 800 commercial transits, including tankers, occurred in the preceding 6 months. The vessel's condition, location, and projected track made it a serious threat to the safe navigation of other vessels in the vicinity. The Coast Guard deemed the derelict vessel to be a hazard to navigation, and on April 5, the Coast Guard cutter ANACAPA successfully sank the ship at sea to ensure the safety of navigation.

Having been the captain of a ship like ANACAPA nearly 20 years ago, I was very proud of their ability to perform this mission. As I tell others, we save lives, we save the environment, and in this case we saved the supply chain so vital to the economic strength of the Nation that includes putting fuel and food on our tables. It could have been disrupted by the damage that that ship might have caused.

The Coast Guard will continue to work closely with NOAA to address the potential navigation hazards of marine debris and respond to any substantial pollution threats or hazards to navigation.

Thank you and I look forward to answering any questions you may have.

[The prepared statement of Admiral Thomas follows:]

PREPARED STATEMENT OF REAR ADMIRAL CARI B. THOMAS, ASSISTANT COMMANDANT,
RESPONSE POLICY, U.S. COAST GUARD

Introduction

Good morning Mr. Chairman and distinguished members of the Subcommittee. I am pleased to have this opportunity to discuss with you the Coast Guard's roles and authorities to protect U.S. waters and shorelines from the potential impacts of marine debris created during the 2011 Japan Tsunami.

Summary

The Coast Guard, as a member of the Interagency Marine Debris Coordinating Committee (IMDCC) supports the National Oceanic and Atmospheric Administration (NOAA) in NOAA's roles as the Chair of the IMDCC and the lead agency for conducting research, monitoring, prevention, and reduction activities for marine debris.

The Marine Debris Research, Prevention and Reduction Act of 2006 identifies the Coast Guard as one of the agencies that NOAA should coordinate with to address marine debris issues like those caused by the 2011 Japan Tsunami. The Coast Guard is supporting NOAA's marine debris monitoring and tracking efforts to ensure safe navigation for shipping and to protect the marine environment by actively monitoring for debris that would create a potential hazard to navigation or present a substantial threat of pollution.

Coast Guard Authorities Related to Marine Debris

Coast Guard actions in support of NOAA are based on the type of the debris. While NOAA is the lead Federal agency for marine debris and the Coast Guard supports NOAA, there are certain instances in which Coast Guard authorities result in the Coast Guard taking on specific roles. In cases where debris poses a potential oil or hazardous substance threat to the environment, the Coast Guard, as the Federal On Scene Coordinator (FOSC) for the Coastal Zone, will lead removal actions under the National Contingency Plan (NCP).

The Coast Guard may also develop and issue Broadcast Notice to Mariners (BNMs) to advise vessel traffic of potential hazards to navigation. In certain circumstances the Coast Guard may destroy or sink a hazard to navigation.

For instance, in late March the Coast Guard began tracking the derelict 200-foot unmanned and unlit Japanese fishing vessel RYOU-UN MARU after it was sighted by the Canadian Coast Guard. The Coast Guard deployed data marker buoys and conducted daily over-flights to monitor the position of the vessel. The Coast Guard then conveyed this information to mariners via BNMs transmitted over marine VHF radio.

When the vessel entered the U.S. Exclusive Economic Zone on Saturday March 31, 2012, it was drifting west northwest in a location approximately 170 nautical miles southwest of Sitka, Alaska. The drift of the vessel brought it toward the approaches to Dixon Entrance, Alaska, a waterway where approximately 800 transits, including those of tank vessels, occurred in the preceding six months. The vessel's condition, location, and projected track, made it a serious threat to the safe navigation of other vessels in the vicinity. The Coast Guard consulted with the Department of State to ensure that any action would not have adverse international implications and ultimately deemed the RYOU-UN MARU a hazard to navigation. As a result, the Coast Guard Cutter ANACAPA successfully sank the RYOU-UN MARU at sea on April 5, 2012 to ensure the safety of navigation.

Additionally, the Coast Guard frequently works with the U.S. Army Corps of Engineers (ACOE) to manage debris that creates a hazard to navigation in navigable channels or waterways. ACOE is the lead Federal Agency for all obstructions determined to be in federally maintained navigable channels and waterways. All other types of simple debris that do not pose a pollution threat or a hazard to navigation would be managed by state, local, or tribal jurisdictions.

Coast Guard resources and personnel may also be requested by NOAA to support NOAA's mission of debris monitoring and tracking. For example, the Coast Guard has conducted several over flights with NOAA representatives onboard to help identify debris in locations such as Montague Island, Alaska.

Operational Planning and Coordination

At the national level, NOAA has overall lead for tracking and reporting on the status and trajectory of marine debris. The Coast Guard further supports NOAA by participating in bi-weekly interagency conference calls, hosted by NOAA, to provide strategic interagency coordination, awareness, and information sharing.

At the regional and local levels, the operational commanders of Coast Guard Pacific Area, the Thirteenth District in the Pacific Northwest, the Fourteenth District

in Hawaii, and the Seventeenth District in Alaska are actively engaged with other Federal, state, local and tribal partners to provide a common operational picture and alignment of responsibilities. The Coast Guard is also currently working with NOAA to develop a public outreach and awareness communication strategy. As part of this outreach effort, the Coast Guard and NOAA recently coordinated 10 inter-agency public meetings in Oregon to provide information on agency authorities and capabilities in regards to tsunami debris. Last month, the Coast Guard also participated in an interagency Marine Debris Workshop in Washington State to begin drafting a Washington State Japan Tsunami Marine Debris Contingency Plan. According to NOAA, similar meetings are planned for Hawaii and California in the coming months.

Conclusion

The Coast Guard continues to work closely with NOAA to address the potential impacts of marine debris and respond to substantial pollution threats or hazards to navigation. As with any preparedness activity, these efforts will continue to require a whole of community and a unity of effort across all levels of government.

Senator BEGICH. Thank you very much.

We will start with 5-minute rounds, but the way I like to do the Committee, each Member will have an opportunity to do 5 minutes, but we sometimes will interject with each other because we are small enough here. But we only have a limited time today.

But let me first say my observation here, and then I have some specific questions.

We are going to do a lot of planning, a lot of discussions, a lot of meetings, but what the reality is communities are fearing that the Federal Government will not respond to what is really needed, which is cleanup. If this was a one-time event all at once, we would declare it an emergency and we would be on the ground like that. But this is going to be a slow drag of stuff for who knows how long which will impact.

So I guess first, Mr. Kennedy, you had mentioned—I have several questions, but I want to go to your comments. You said there will be a need for significant funds, but states are going to be responsible. To be very frank with you, it is somewhat frustrating to hear that statement because the role of the Federal Government in emergencies is to assist states, not just say it is your responsibility, good luck, because that is not acceptable. I understand you are having discussions with them and so forth, but do you think the Federal Government has a role to partner and put some hard cash on the table?

I mean, monitoring for the next 2 years, it will be easy to monitor because there will be a pile of junk piled up that we will say, well, it is there. But that is not the plan. That is not a plan. That is just more studies about what might happen after the fact. I think what we are anxious for is what are we going to do to prevent a lot of this starting to come ashore.

So can you give me some more commentary on what NOAA's role should be, and do you have the funds to do it, and why are we not stepping forward and saying we are going to develop plans of action to clean it up with the Federal Government participating financially and otherwise? Help me. I hear what you—I mean, your testimony—you read it well. I have read it. It is a lot of good discussions about developing long-term studies and drafts and so forth. But what we are hearing is it is here. How do we deal with it?

First, does NOAA have a responsibility to help with the cleanup, not just a few grants to the small groups. I know you have a small budget which the President requested to cut. Appropriators put it back in, and they want to shift it to another line office which luckily the appropriators said no. So do you think have enough money to do cleanup? And do you think that is a role that—

Mr. KENNEDY. Well, to start, there was a lot in there, and so I will start answering and then you come back to me when I do not answer the way you would like.

Senator BEGICH. Well, that is good. That is a good way to start the answer.

Mr. KENNEDY. Because I am afraid I am going to, at least in part, answer the way you may not like.

First of all, we do not have the funds to mount a cleanup, especially in areas as remote as Alaska or some of the northwestern Hawaiian islands. They are certainly remote areas. We just do not have those funds.

Senator BEGICH. Can I ask you real quickly? But you have authority to do it and/or partner or assign groups which you, for example, are giving grants to.

Mr. KENNEDY. As I understand the current Act, we do not have the authority to actually do the cleanup. That is not part of our responsibility.

Senator BEGICH. But dollars that you have that flow through your system can go to organizations.

Mr. KENNEDY. Yes, they can and they have routinely for the last many years. That is a major component of what we do and we have invested in community-based cleanup programs throughout all the states that are potentially affected here. So, yes, we do.

Senator BEGICH. Indirectly you have the ability.

Mr. KENNEDY. Indirectly we do.

Senator BEGICH. But you do not have the money is what you are saying.

Mr. KENNEDY. I do not.

Senator BEGICH. Do you know how much that would be required to do what is anticipated here?

Mr. KENNEDY. I do not and part of that problem is why it is so important to try and get a better handle on how much debris we have out there, where it is, and when it may come ashore is to be able to make that kind of an estimate. But I can tell you Kure Atoll, Hawaii, a small sailboat 30-feet long that we wanted to remove, debris, \$1.2 million for that one sailboat in that remote area. We go out to the northwestern Hawaiian islands—

Senator BEGICH. Why?

Mr. KENNEDY.—because of the remoteness, because of the logistics. You have got to have ships to get out there. You have got to people, and then you have got to have someplace to do away with it. So it varies depending on where the debris is, but it is incredibly expensive to do this kind of a cleanup and the few examples that we can give you from around the country where we have done a focused cleanup, especially in a remote area, the expenditure is just extremely high. So we cannot begin to touch, especially in remote areas, if there is substantial new amounts of debris what is going to be required to remove it.

Senator BEGICH. Let me pause you. My time is up for my first, and I will ask the ranking member to go to her questions. Then we will kind of keep bouncing back.

Here is the challenge. You just gave me one example. So you know what something costs. We do not know what you need because we do not know what is the overall cost because literally, to be very frank with you, 3 months ago, 4 months ago, whenever we had the budget hearing, we asked the specific question that in anticipation of the debris coming, have you made a low-risk, medium-risk, high-risk cost analysis of what this would be. And the answer from your administrator was no, which made no sense to us after a year knowing—I do not know. The tsunami did happen. It was coming, but no analysis, then of course nothing then presented to OMB as a budget request, which then of course we get the budget and it is not in there and actually it is a cut to the debris program.

You see the dilemma here? How does that happen? And then I will pause and I will—I mean, this is our frustration. It is not like the tsunami did not happen. It happened. We know about it. No one questioned that it was coming our direction. We just did not know what level of risk. But when I asked a simple question of, well, did you plan for it, did you have some idea, because that is how you then develop your budget to prepare for such a thing, the answer was no.

How do you respond to that? And maybe you cannot. Maybe there is no response here. Like you said, maybe it is a response I am not going to like, so therefore——

Mr. KENNEDY. Well, I do not have an answer that is going to make you happy. That is for sure. I really do not. You know, lots of priorities going on and a small program, and we are out there. We do not know what the scope is, do not have a clue. And I think the idea was, gee, an estimate would be extremely hard to come up with, but that is not a good answer.

Senator BEGICH. Let me hold you here.

Mr. KENNEDY. But an awful lot of it is small program, very busy just trying to get our arms around what is going on, and the scope and magnitude of what a budget might look like I can tell you even low, medium, and high, to actually physically clean up all the debris that you might be able to identify is huge.

Senator BEGICH. OK. Let me pause you now.

Senator Snowe?

Senator SNOWE. Thank you, Mr. Chairman.

Just to follow up on this issue, how much do you estimate of the 1.5 million tons of debris that is out there will reach our shores?

Mr. KENNEDY. Part of our problem—of that 1.5—and that is an estimate from Japan, by the way. I mean, it is not ours. We have had to rely on them. And looking at the types of debris, there is virtually no research done on marine debris in the ocean that would tell you if you have got 1.5 million that is floating and you leave it in there for a year, how much of that is still going to be floating and available to come ashore. We do not have a clue.

We have been talking about is there any way we could go back and find some debris and do some research, but for the time being, we do not really know. And we have asked. We have asked in a lot of places. The National Science Foundation does not have a

chair for marine debris. And so it is not a very well studied aspect and we do not know for sure.

We certainly know that things like containers, like floats like we are already seeing, the high windage things that have been discussed and the Styrofoam, OK. But a whole bunch of that 1.5 million was construction debris, and do 2 by 4's still float after a year? We are not sure.

Senator SNOWE. On the low windage—and I do not know if there are characteristics that you can determine and assess beforehand. Low windage that float at or just below the surface—we have no way of discerning how much there may be?

Mr. KENNEDY. We really do not at this point. In our modeling deliberations, we have been working pretty hard at trying, and again, there are no models that are generated for marine debris. So we are having to adapt oil spill models and other kinds. We are trying to work and figure out high windage versus the stuff that either is on the surface or subsurface is going to come in at a different level. That is why we are saying in the next couple of years because currents are going to drive some of that stuff that is right at the surface or below the surface a lot more than the winds that will drive the other. But again, a lot of speculation and guessing at this point.

Senator SNOWE. I just cannot understand why in the President's request, though, that there was a reduction in this program in terms of costs in the Marine Debris Program. From the beginning of its creation back in 2005, the high was a little more than \$6 million, \$6.3 million. Now we are down to what the President requested was \$3.9 million. And \$600,000 last year was appropriated specifically for this program because of the tsunami. Why then would we not continue at that level? Why would the President not?

Mr. KENNEDY. Why would we not continue at that level?

Senator SNOWE. Continue, yes, at a higher level incorporating the assumption that we have an ongoing issue here with the tsunami debris. We are just beginning the process. It is not at the end of the process. We are just beginning.

Mr. KENNEDY. Well, the main answer is there are severe cuts across the Federal Government, certainly within NOAA, and decisions have to be made where you get all the cuts. And so that is it.

Now, to me the Marine Debris Program started with me in its infancy. I think it is a very important program. We absolutely appreciated the ability to have that \$600,000-plus because if we did not, we would not have been able to put even the attention we have tried to put on the debris program. So it has been very important to us and we hope we will be able to find a way to continue to have some resources to focus on the issue because it will be around for a while. But there is the President's budget.

Senator SNOWE. Yes, I know. I think we should be discriminating in terms of what is essential is a priority, and we should have some preplanning and some forethought involved, knowing that the bulk of this debris is going to occur presumably in 2013 and 2014. Correct?

Mr. KENNEDY. Yes.

Senator SNOWE. Do you think the bulk will occur in 2013 as some scientists are saying?

Mr. KENNEDY. Yes.

Senator SNOWE. You do.

Mr. KENNEDY. Potentially yes.

Senator SNOWE. So here we are facing reductions in the very program that is going to be essential. OK. Well, obviously, it does not make sense, and that is something that has to be remedied.

Admiral Thomas, I wanted to ask you, do you have the characteristics in terms of determining the low windage items? Are you capable—is the Coast Guard—of making those distinctions?

Admiral THOMAS. So, Senator, what we do when we prosecute a search and rescue case, for example, is we take into account, because of the information NOAA provides us—what we will do is try and figure out what we are looking for. Are we looking for a person in the water? Are we looking for a boat? Are we looking for debris? And then how time passes, the effects of the winds, the effects of the current all of that has on our ability to search for something, how long we are going to need to search for.

I had a case when I was in Miami. We were looking 3 days, an area about the size of Connecticut, for an 18-foot boat, we thought, with three men. We finally found them on the third day about 150 miles away from where they started. And that was, you know, compared to the 6,800 miles between the U.S. and Japan, a significant problem set because it is a very vast ocean.

So the Coast Guard, you know, in the process of prosecuting our cases uses NOAA's weather to help guide our actions.

Senator SNOWE. Thank you, Mr. Chairman.

Senator BEGICH. Thank you very much.

Senator Cantwell?

Senator CANTWELL. Thank you, Mr. Chairman.

Mr. Kennedy, Dr. Lubchenko was here in March and she said, quote, it is not clear that the tsunami debris is going to have any kind of—is going to have a devastating impact by any stretch of the imagination. So is that NOAA's view? Is that still NOAA's view?

Mr. KENNEDY. I think the jury is still out. We have been doing a tremendous amount of work trying to locate any of the debris that would be in the ocean in where we have projected, modeling has projected, that that debris would be. In my testimony, I mentioned that we have been to every possible venue to try and find debris, including looking with high resolution satellite imagery, in quadrants where the models say the debris should be. We have not been able to find any debris. That is not to say it is not there. It is not to say we are not still looking.

But I think the concern is not overreacting right now. We know that there are places where there is more debris ashore. We have seen that in Alaska. But we have been out there with our partners trying to identify that debris specifically as from the tsunami, and for the most part, we have not been able to do that. And so we know there is increased debris here and there. We have not been able to find it at sea. We know we had 1.5 million tons that went in the water. How much of that gets to the other end? So I do not think we want to get overly alarming with anyone in that we are continuing not to have any evidence of major debris out there in

the ocean that is going to come ashore. So that is, I think, more the thinking than that it is not an issue because if 1.5 million tons of debris comes ashore on our coasts, that is going to be a problem. We know that.

Senator CANTWELL. Well, Mr. Kennedy, I am definitely going to react when thousands of cans of hazardous materials wash ashore and they have things like rat poisoning and gas in them. We are going to react. So that has happened.

And so the notion that—you said earlier to Senator Begich that we do not have a clue about the debris. And so I have heard what you just said. So have we gotten all the information from DOD about the satellite imaging and information we need? Have you requested it from NOAA? Have they responded and given it to you, or is there more data and information that should be being made available?

Mr. KENNEDY. We started with commercial and available satellite imagery that we had, but we have progressively gone—I mentioned the NGA. We have progressively gone to other types of imagery, including classified, and are continuing to have discussions for further classified satellite imagery. So we are working down that path, and we have begun to get classified imagery and we are using it. In fact, we are using it to look in several quadrants right now to find debris. Have we done every satellite out there that may be generating imagery? I do not think so, but we are having some discussions about how we get to that next level right now.

And by the way, I am certainly not suggesting that debris will not come ashore and that some of that may be HAZMAT. In fact, the first thing we did, when we started hearing about increased debris on Montague and some of the places in Alaska, is get out there with the Coast Guard to do surveys to find out if there is any HAZMAT in it. We are acutely aware of HAZMAT being an issue. It is a different kind of issue if and when we have hazardous materials debris come ashore.

Senator CANTWELL. Did you see the ship coming? Did you see the ship behind me coming? Because it is a pretty large vessel.

Mr. KENNEDY. Yes. Did we see it coming?

Senator CANTWELL. Yes.

Mr. KENNEDY. The first time we saw it is on a commercially chartered surveillance flight by the Canadians. We did not see it on satellites or any other efforts that we had underway. That is the first we knew about is when this commercial charter reported it to the Canadian authorities.

Senator CANTWELL. And is there something top secret about this information? Is there some reason why we cannot use all satellite information? Is there something that is stopping us from getting access to this?

Mr. KENNEDY. Some of the discussions that we have been having recently are that imagery is available, but do we divert resources looking at things that are pretty important from national security issues to do marine debris instead? It is kind of an either/or discussion we have been having.

Senator CANTWELL. I do not know if it is an either/or discussion, but I guarantee you we will get to the bottom of it because we definitely believe that academics in the Northwest and perhaps

throughout the country can help with better modeling. We have seen time and time again when NOAA has the information and resources great modeling can happen. We have great modeling right now, for example, on tsunami response. If something happens with our Cascadia Fault, we can have information. We can have plans. We can get that to the local communities.

So the notion that we are not getting, as Senator Begich said, a high, moderate, and low estimation and here are response plans that go with it so that we can adjust—what we are doing is we are getting caught off guard with this vessel showing up, as I said, thousands of cans of hazardous material showing up. And the notion that states are going to be left to respond is just not what we are going to do to protect our coastal communities.

So I thank you for your statement on this, and I am sure we will have more questions.

I see my time is up, Mr. Chairman.

Mr. KENNEDY. If I could, just one thing I wanted to make sure you are aware of, if you are not, that the modeling that we are doing is not done in a vacuum. In fact, the University of Washington in particular is at our table and working with us on models. We have been working with a number of academic communities throughout the West Coast and Hawaii, University of Hawaii model. And we are working with the local academic communities right now to try and make sure that we pick up their specific science, their models, their data so that as this debris—and we can begin to identify—gets closer to shore, we are using their models not just ours. So we are trying to engage them.

Senator CANTWELL. Well, if I am correct—and I will find out, Mr. Chairman—I think we actually used the University of Hawaii model at a previous hearing, not even the last one we had with Administrator Lubchenco, but a previous markup in the Committee when we were trying to make sure that your Marine Debris Program was not cut. And so the modeling that was used by the University of Hawaii showed a very, very large field of debris, as someone said in their statement, the size of one of our large western states, approaching us. So that seems to be something that would be hard to miss. And so hopefully we can get to the bottom of this about the data.

Senator BEGICH. We will probably have enough time for another round. Let me follow up very quickly, and I want to make sure—you were very careful on your words. I want to make sure, Mr. Kennedy, I understand.

Is there data that—you know, this ship is a great example. My guess is the military data probably knew this ship was out there. If they did not, then we have got bigger problems, to be frank with you. If Homeland Security and the military did not know the ship was this close to the United States and it was just floating unmanned—I doubt they did not know this. I sit on the Armed Services Committee, Homeland Security Committee. My bet is they knew.

Are you getting the data you need? And I understand it is not an either/or either. I think it is a question of you getting access. They can still do their stuff. The military is never going to let you take priority, but getting access so you can at least observe areas

that may have something of that size—I mean, that is big. And I literally learned about what was happening when I was in Seattle that day when it turned its course toward Alaska, and then it was a week later the Coast Guard took action. But you know, that is not how we should find debris.

So are you getting access from the military and/or Homeland Security that you need in order to better modeling?

Mr. KENNEDY. We are getting access. Here is part of my problem. First of all, I am not the one in the middle of these day-to-day discussions, and they are taking place and we have experts on our side that are working with NGA and Defense. And so I want to be very measured in what I say. We are getting access to classified data. Are we getting access to all classified data? Well, I do not know. We might be. We certainly have had nobody admit that they saw that ship coming that we have been discussing this with, and I think what we know is that there are probably other layers of data out there that we may not know how to ask about.

Senator BEGICH. But it could be helpful.

Mr. KENNEDY. Yes. We are in some discussions, and I do not want it seem that everybody has not been cooperative because I think, for the most part, they have. But I think part of the problem is NOAA stepping into this arena is one that we are not very familiar with and we probably do not know who all that we need to be talking to.

Senator BEGICH. I guess we would respond that I think the Committee is interested in helping you get that data. There is a letter that Senator Cantwell and I sent a month and a half ago to the President saying get you this data, which we—just to note for the record—do not have a written response yet. But that's not your issue—that is the White House.

The second thing is, has NOAA asked the National Science Foundation—this the RAPID program funding money that they have for these kind of emerging issues. Has NOAA asked for some of this money to help you move faster?

Mr. KENNEDY. We have had a discussion with the National Science Foundation about this. We used them very effectively with their RAPID response grants during *Deepwater Horizon*. They were very, very helpful for us there.

Senator BEGICH. Exactly because that was something you saw right away and they jumped. But here is something that is, like I said, a slow drag.

Mr. KENNEDY. They got money on the ground for us on focused research areas.

Senator BEGICH. Are they receptive?

Mr. KENNEDY. They are receptive, but as I understand it—and again, I am not the one that had these discussions, but relayed to me, they were receptive but they did not feel like they had the funds to engage.

Senator BEGICH. Let me ask on one issue I am concerned about and that is one of the parts of the debris is a sizable amount. And either one of you could answer this, and I think, Mr. Kennedy, you probably will be knowledgeable on this and that is the whole issue of plastics, Styrofoam, these items that, when they come ashore, they stay for a long time. They are not disappearing overnight.

They are not going to be biodegradable. Tell me kind of the thought on that. As it ends up on the shores or in the big garbage patch—I am assuming a sizable amount of this—some is going to end up in the garbage patch or on our shores. And when I say “ours,” the United States’ shores. Is that a fair statement?

I mean, the plastics seem to be—I do not know whichever one wants to feel comfortable answering this. Maybe you cannot. But it seems like this is one of the products that is not sinking, not going to disappear in the water. It is going somewhere. Is that a fair statement? It may break down, but it is plastic.

Mr. KENNEDY. I think that is a fair statement. It is a fair statement. I mean, I do not think there is any question because I have spent a lot of time on remote shores in Alaska and everywhere—

Senator BEGICH. Plastic is everywhere.

Mr. KENNEDY. It is there.

Senator BEGICH. Is that a big concern, do you think? I mean, that kind of product, not the quantity. Let us put that aside for a second, but that type of product.

Mr. KENNEDY. It is a big concern, and it is one of the things that the Marine Debris Program has been looking at in general trying to research to get a better handle on the toxics, the biological implications, and the socioeconomic, all of that because this stuff is so long-lived and it is going to be around forever and it is going to get ingested. It is going to get tangled. So it is a huge problem.

I think part of the complication with that debris and how it gets here is—you mentioned the garbage patch. Well, there are two or three garbage patches, and as you go across the ocean, the circulation does not just come straight across the ocean. It rolls and some of this stuff could be entrained there for a long time before it ever pops out of one of the patches.

Senator BEGICH. You did lead in this, so I will close on this part, Admiral. And I appreciate you being here also. I just saw one of your new cutters, a very impressive piece of equipment, down at the dock here.

The comment that Mr. Kennedy said in regards to that plastic is toxic. Now, I know you deal with hazardous waste. Does this fall anywhere into your arena or not because it is actually still a product, not turned into a, quote, hazardous waste like an oil or fuel or chemical?

Admiral THOMAS. Thank you, Mr. Chairman.

The authorities that we have deal with oil and hazardous substances, and so for example, in the ship that Senator Cantwell referred to, what we did, when we realized that the owner was not going to take responsibility for that ship, is we opened up our oil spill liability trust fund and then sent divers down to close up the leakage area, then recovered the oil from that ship. And so that is really the procedures that we do.

Senator BEGICH. The ship she talked about in her opening testimony.

Admiral THOMAS. Yes. Yes, the Deep Sea I think is the name of the ship, 128-foot commercial fishing vessel.

And so the plastics would not apply in this case.

Senator BEGICH. Very good.

Let me end there. Senator Snowe?

Senator SNOWE. Do you work with coastal communities in terms of the potential of these hazardous materials? Is the Environmental Protection Agency involved?

Admiral THOMAS. Yes, Senator. The National Contingency Plan that was developed after the Oil Spill Act of 1990 calls for a framework in which then there are regional plans that need to be developed. There are exercises periodically that come about. You need to have local strategies that are refreshed and that include the community in the education process of what you would do in the event of an oil spill or in the event of a hazardous material release.

Mr. KENNEDY. And we probably have done 100 meetings with the local communities from Hawaii to Alaska and up and down the coast talking with them about what they might expect, what some of the issues are that would be associated with this, and that is in addition to all the planning that we have been trying to do with a contingency plan. So we have been on the ground all up and down the coast at the local level trying to make communities more aware.

Senator SNOWE. On the interagency communication, because I gather there are nine agencies or departments that are involved in this effort, and you have the coordinating committee for response to marine debris, how is that working? Is it responding quickly? Do you have the ability to respond quickly? Particularly, Admiral Thomas, does the Coast Guard if there is floating debris that could be a navigational hazard for mariners? What do you do in that instance? Does it work well and effectively?

Admiral THOMAS. So I will defer to NOAA because they are the chair. But I can say that these interagency committees—we do it for policy on search and rescue. Of course, we saw the national response team interagency group during the *Deepwater Horizon* oil spill. And so these interagency ways in which—you are living in limited resource times, but you need important work to be done. You have to bring all these agencies together.

The Army Corps of Engineers is a truly important part of this process as well to make sure that those waterways can stay open so that the ships can keep moving in and out of the United States.

Mr. KENNEDY. So it has been interesting. The national level coordinating committee has been more of an information exchange and more of a do you have a resource that you ought to have as we discuss this.

The real effective part of the coordinating has been going on in the regions. And we have had tremendous participation by most of the Federal agencies, routinely EPA, Coast Guard, different manifestations of DOI, from MMS to Parks and what have you. So the real strength has been at the regional level, and my team has repeatedly commented on how people—and that is again all the Federal family, but then State and local—have been stepping up to be engaged in the region.

And of course, part of the issue here is we have tremendous monuments, parks, all of which are going to be affected by marine debris just like anything that comes ashore in a state-owned part of the coast. And so all of them have to be prepared too. So it is not just ultimately the states that have issues.

Senator SNOWE. You said, Mr. Kennedy, in your testimony, that with respect to contingency planning, it is well underway in Hawaii and Washington, but the process is yet to start in Oregon and California and Alaska. How long does that process and planning require?

Mr. KENNEDY. What it requires is a complete willingness of all the appropriate parties, and that is why we kind of emphasized that in the testimony. You have got to have everybody want to be at the table to actually then put the workshop together and develop it. And so there have been various states of interest and organization that have been required to put these together, and that is why these others are still evolving.

But what we have been able to do is kind of develop now a pretty standard protocol as a basis for the uniqueness of each region and we are using that protocol. So it includes everything from getting together to talk about within a region, who are the Federal and State and local entities that need to be engaged. Who would you call if you started to have debris? What would they be looking for? What are some of the specific issues? How are we going to look and make sure we have radiation under control? If there is HAZMAT, how are we going to make sure we get the Coast Guard and the State folks? All of that is part of a package that we develop. It has just been a little slower to evolve getting all the appropriate parties to the table in some of those states.

Senator SNOWE. Is there a recognition in these states across the board about the potential for the magnitude of this problem? Does it vary?

Mr. KENNEDY. I think it varies a little, but again, I do not do this day to day. So I would defer. But certainly we know that Alaska and Washington in particular are very interested. We know that. And the others know that they are within the realm of potential impact, but Washington and Alaska and Hawaii for that matter, we know very clearly they have interest.

Senator SNOWE. Thank you.

Senator BEGICH. Senator Cantwell?

Senator CANTWELL. Thank you, Mr. Chairman.

This is the chart that we had gotten from the University of Hawaii and it shows the migration of millions of tons of tsunami trash basically making a good trajectory right toward the West Coast. And you can see by the size of the marine debris field that we are talking about large-scale debris. So when you say NOAA is looking and you do not see anything and then you are working with partners, this is what your partners are coming up with.

So I hope that after today, we can get the information, get it to these partners, and come up with, again, some assessments about really what we are doing because when our constituents see this, when they go online and they see this, they are very concerned. And so I think we have to—

Which brings up one very basic point which is we have—we had wanted, Mr. Chairman, one of our local communities' mayors to be here. But I think because of the scheduling of the Committee we could not accommodate a second panel.

But one of the things is that 911 operators want to know what to tell people when they are called about this marine debris. So

when somebody calls and says, well, we see, you know, cans, we see personal belongings, we see Styrofoam, these local communities have said they have tried to get an answer from NOAA about what 911 operators are supposed to tell people. So what are 911 operators supposed to tell people?

Mr. KENNEDY. I cannot give you specifically what they are supposed to say, but that has been part of the discussion as we have worked this issue in most of the states. It is certainly part of the discussion that has been in the contingency plan development. We obviously need to educate people better, but I think that has been part of what has been covered. So I cannot give you the specifics, and we will certainly get you something for the record and make sure it is—but, you know, we are working with the local responders on this.

And by the way, the University of Hawaii is one of the consortium of modeling organizations that is working with us on the model that we are updating every 2 weeks. Did we get one of these around to you folks? OK. So I do not think we have competing models. I think we have tried to make sure that we have gotten anybody that is involved in this and has expertise at the table to develop this model, at least as a consultant.

Senator CANTWELL. Well, Long Beach is a very beautiful part of our state. I wish we had a map of our state right now because you would see that it is the very exposed part on the coast of our state, a very large tourism area. And the fact that the mayor is trying to get answers is very important.

I wanted to get to something else. I know we are out of time, Mr. Chairman, but another aspect of this concern is, obviously, our migratory fish, the tuna, the salmon. These are a great part of our ocean species that migrate and oftentimes they migrate along these paths of debris. So what do you think the risks are there to our tuna and salmon populations?

Mr. KENNEDY. I think you have stumped me. My fisheries colleagues probably need to answer that question for you. I am a little bit familiar with the issue. I have not heard it in the context of our deliberations on the tsunami debris and what the potential impacts are there.

Senator CANTWELL. Well, I think just with what happened with *Deepwater Horizon*, people wanted answers about what the impacts were going to be on those fisheries there. So, again, something that we hopefully will get an answer later for the record and we would appreciate it. Again, we just want an assessment if that kind of debris field is going through and there are migratory patterns where these species do follow these kind of debris fields, then what are some of the risks associated with it.

So thank you, Mr. Chairman.

Senator BEGICH. Thank you all very much.

First, Admiral, thank you for your attendance. And I know some of us will have some more questions for the record, and I think we will keep it open for 10 business days for folks to submit questions.

Mr. Kennedy, also thank you. And I know you probably feel like you have been on the hot seat and we hope you did feel that way.
[Laughter.]

Senator BEGICH. There is a lot of concern. I know you care because you were one of the originators of the debris program within NOAA, and I know you understand it. And my guess is—I will just put words in your mouth without you saying them. But I am sure you would like more resources to do more and more opportunities. There is a huge demand and this may be an opportunity to highlight what the needs are for the component of what you are doing within NOAA.

Second, you made a comment. I want to take you up on that offer, and that is the issue of the low-, the medium-, the high-risk analysis. Probably every quarter I am going to probably ask this same question until we get an answer. My hope is that is not at a point where we are looking at these photos enlarged because the amount of stuff has now really piled up. So I hope that you can get the administration to respond on that issue.

And then the last is recognizing that NOAA has a certain role, but I know in this situation maybe it is a re-analysis of how NOAA responds to these issues. And maybe it is a larger allocation to these NGO's that are doing incredible work and have been for years on cleaning up the beaches and so forth. But now we are in a different ball game and we will be in it for, as that one diagram shows there, many years. And maybe NOAA needs to rethink how they are approaching debris, not just monitoring and reporting, but a more active role because we have now a stream that is not just incidental. It is significant. So I would hope you would take that back.

But, again, the record will be kept open for 10 business days for additional questions. And I have a feeling we will continue to have a great discussion about debris. Thank you all very much.

The hearing is closed.

[Whereupon, at 11:37 a.m., the hearing was adjourned.]

A P P E N D I X

PREPARED STATEMENT OF HON. DANIEL K. INOUE, U.S. SENATOR FROM HAWAII

Chairman Begich, let me start by expressing my deep appreciation to you for holding a hearing on the important issue of marine debris resulting from the great Japanese tsunami of 2011. This tragic event not only caused tremendous loss of life and destruction on a historic scale, but also resulted in an immense volume of material being washed out to sea. The Japanese government has estimated that the tsunami initially generated as much as 5 million tons of so called "marine debris" but that, of this huge total, 70 percent is likely to have sunk near shore. Even removing such a large fraction, however, would still leave some 1.5 million tons of material that may have been entrained in ocean currents and begun to float across the Pacific. I understand that some debris has, in fact, already begun to show up along the Alaskan coast including a large derelict fishing vessel. This is in keeping with National Oceanic and Atmospheric Administration (NOAA) models which suggest that at least some of the debris will continue to arrive on our shores over the course of the next several years and will thus continue to pose some degree of risk to our safety, environment, and economy.

As we consider this risk we must bear in mind a number of points. The first is that we do not know how much of the tsunami related debris is actually still afloat and thus cannot make an accurate prediction as to how much will ultimately arrive on our shores. The second is that, though the Japanese tsunami generated a severe and massive input of debris into the ocean, it was an acute event while the problem of marine debris is pervasive and continuous. We in Hawaii sit at the center of a large convergence of several ocean currents and, as a result, must annually remove many tons of debris from our shores. Finally, the Japanese tsunami may or may not result in a significant increase in risk associated with debris volume, but I am concerned about the increased risk from distinct interactions such as with the recently identified derelict fishing vessel. This was a vessel of significant size and would have caused significant damage, and incurred significant remediation costs, if it had grounded on any of our reefs.

For all of these reasons, our response to the tsunami generated debris must be one of continued research and assessment as well of continued vigilance and response. I have therefore worked to secure increased annual support for the NOAA Marine Debris Program, in both the 2012 Appropriation and the Senate's current Fiscal Year 2013 Commerce, Justice, and Science spending bill and it is also why I have introduced S. 1119, The Trash Free Seas Act of 2011. This bill would reauthorize and strengthen the Marine Debris Research, Prevention, and Reduction Act of 2006 and ensure continued support for both the NOAA and Coast Guard Marine Debris Programs. Chairman Begich, I know you are an original co-sponsor of S. 1119 and thank you for your support. I am hopeful that we can pass this bill out of the Senate in the near future and move on similar legislation in the House.

In closing, I would like to note that though we consider here today the risk that the tsunami generated debris poses to our national interests, we must also be mindful that this debris is not just random detritus cast upon the sea, but is in fact the remnants of many thousands of lives and livelihoods. It is therefore incumbent on us to deal with this real and persistent management problem in a manner that acknowledges the human loss as well as the environmental threat.

Thank you and I look forward to hearing the testimony of our two respected witnesses.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOHN D. ROCKEFELLER IV
TO DAVID M. KENNEDY

TRANSFER AND CONSOLIDATION OF MARINE DEBRIS PROGRAM

Question 1. The President's budget request calls for the transfer of NOAA's Marine Debris and Estuary Restoration programs, currently housed in NOS, to NMFS'

Office of Habitat Conservation, arguing that the consolidation will improve efficiencies through increased coordination between programs with complementary missions. The proposed consolidation would reduce funding for these two successful programs by \$1.2 million. The Senate CJS bill maintains the Marine Debris Program in NOS and sustains past funding levels. Can you explain to me the reasoning for moving the Marine Debris Program to a new line office? It's a program with demonstrated significant success for a very small amount of money per year. Why disrupt the program?

Answer. In its FY2013 budget request, NOAA proposed moving the Marine Debris program to the NOAA Restoration Center to streamline grants programs. Since 2007, approximately \$1 million of the Marine Debris program's annual budget has been administered by the NOAA Restoration Center through the Community-based Restoration Marine Debris Removal Grants. The NOAA Restoration Center implements on-the-ground habitat restoration projects for many different programs within NOAA. NOAA does not expect the proposed consolidation would change the core mission of the program. The program would still advance the goals of the Marine Debris Research, Prevention, and Reduction Act (MDRPRA), and NOAA expects that the streamlined grants operations would improve services for our stakeholders.

Question 2. In transferring the Marine Debris Program over to NMFS, NOAA also requests cutting its budget by over 20 percent. Is now the right time to be reducing funding for this already tiny program, less than a year after the Japanese tsunami, particularly when the agency has projected impacts are likely to linger until at least 2016?

Answer. In these times of constrained budgets, it is important that NOAA focus on making programs more efficient. Within the amount requested, NOAA expects to continue the Marine Debris Program's core base activities of identifying, assessing, preventing, and removing marine debris.

Question 3. Considering the new proposed home for the program (the National Marine Fisheries Service), I'm not sure I see that's the best fit. While it's true that one of the significant concerns over marine debris is the impact on fisheries and wildlife, the Marine Debris Program's other responsibilities, such as mapping, identifying, and conducting research on the nature and impacts of debris, seem likely to be better met within the National Ocean Service. Would this transfer have happened if the Administration wasn't seeking to cut funding for the program?

Answer. NOAA is proposing the consolidation of the Marine Debris Program into the NOAA Restoration Center to streamline grants activities. The goal of the consolidation would be to improve program effectiveness and enhance services to stakeholders. The consolidation of the Marine Debris Program into NOAA Fisheries would not change the core mission, or results of the program, which is research, prevention, and reduction of marine debris.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARK BEGICH TO
DAVID M. KENNEDY

TRASH FREE SEAS ACT

Question 1. Last year the Committee passed Senator Inouye's bill, the Trash Free Seas Act to reauthorize and update the Marine Debris Research, Prevention, and Reduction Act. I'm pleased to be a co-sponsor and am working to secure its passage in the Senate. How will passage of The Trash Free Seas Act help you fulfill your missions in the response to tsunami related marine debris?

Answer. Since its inception, the NOAA Marine Debris Program has responded to the marine debris issue as mandated by the MDRPRA, by conducting activities to identify, assess, reduce, and prevent marine debris and its impacts. The Trash Free Seas Act would give the program clearer direction to focus on specific types of impacts and responses. As one example, the reauthorization bill provides guidance on emergency response activities. In 2005, NOAA used its authority to identify marine debris from Hurricane Katrina and provided scientific support to the U.S. Coast Guard (USCG), Federal Emergency Management Agency (FEMA), and Gulf States to inform debris removal operations. We are currently facing a similar situation with a variety of debris hazard preparedness and response challenges related to the Japan tsunami debris.

The Act would strengthen NOAA's authority to prevent, reduce, and remove marine debris. If enacted, the Act would authorize NOAA to build upon existing efforts to prevent, reduce, and remove marine debris by continuing research into marine debris and its impacts, expanding partnerships nationally and internationally, supporting local communities with removal projects, and increasing efforts to educate

the general public and industry on best practices for keeping debris out of the water. NOAA can also improve efforts to address marine debris by further investigating marine debris' impacts to our economy.

The Act also would require NOAA to develop tools and products to address marine debris. While NOAA is already taking actions to develop and enhance these tools in response to the tsunami debris threat (*e.g.*, working with satellite experts across the Federal government, academia and commercial sectors to test satellite imagery on controlled sample debris off Hawaii), the passage of the Trash Free Seas Act would further strengthen NOAA's emergency response role related to marine debris.

Question 2. Recognizing there are many other laws also applicable to marine debris issues, can you identify any gaps in the authority and resources available to address impacts that may be felt from the Japanese tsunami?

Answer. The primary responsibility for cleanup and disposal of marine debris is held at the State and local levels, with additional Federal support. The Federal government plays an important role in supporting State and local efforts to respond to the challenge of marine debris, including reducing risks to safe navigation, mitigating hazardous wastes and pollutants, monitoring, collecting and sharing data, and removing debris from Federal lands, among other measures. Federal agencies have various programs and authorities that allow for monitoring and mitigation of debris and have been engaged on the issue of tsunami marine debris in partnership with States and local governments and other stakeholders.

These authorities, coupled with State authorities and Federal and State capacity to implement removal operations should be adequate to address even a significant marine debris impact. NOAA's authority to conduct removal activities is contained in the MDRPRA, which it meets primarily through community-based removal grants. The authority to remove hazardous debris, when within Federal navigable waterways and federally authorized navigation projects, rests with the U.S. Army Corp of Engineers; and with U.S. Environmental Protection Agency (EPA) and the USCG when containing hazardous substances, pollutants, or contaminants which may present an imminent and substantial danger to public health (per Section 104 of CERCLA), and/or oil or hazardous substances (per Section 311(c) (1 & 2) of CWA and amendments to OPA). USCG and EPA's implementing regulations for these authorities are found in the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300.

DEBRIS TRAJECTORY

Question 3. A recent report by NOAA suggested that debris would approach the West Coast of the U.S. in 2013, and yet there have already been reports of large debris items washing ashore along the West Coast linked to the tsunami. How are scientists modeling and predicting where debris will travel?

Answer. To better understand where tsunami debris currently is and where it may wash up on shorelines, NOAA researchers are using computer models to identify the debris items' possible path and drift rates.

Early modeling efforts, which helped inform NOAA's forecasts of the debris' general path and drift rate was based on historical ocean condition data. However, many variables affect where the debris will go and when, and there is no guarantee debris will stay on a predicted path. Items will sink, disperse, and break up along the way, and winds and ocean currents constantly change, making it very difficult to predict an exact date and location for the debris' arrival on our shores. Different items may also drift at different rates based on their type and composition.

The new modeling effort focuses on integration of near-actual U.S. Navy HyCOM current data and NOAA blended winds data to the General NOAA Operational Modeling Environment (GNOME) model, which has been used in the past for oil spills, to "hindcast" rather than "forecast" where the debris has moved since the Japan tsunami. This approach uses real-world weather and currents to update the model predictions, rather than projections based on historical data. In addition, previous modeling efforts used primarily low-windage objects, objects with a smaller sail area that are less affected by wind. The GNOME model includes particles with a range of windage values to represent diverse debris types and behaviors, including very high-windage estimates based on the USCG windage/leeway library. Based on these refinements, the GNOME model shows high-windage particles began arriving in the Pacific Northwest and Alaska in the winter of 2011/2012, but that the bulk of the debris is likely still dispersed north of the Hawaiian Islands. The GNOME model is updated with new current and wind data every month.

Additionally, the Japanese have provided models of marine debris timelines and trajectories, as well as information about the type and quantity of debris that was carried away by the tsunami. This information has assisted in U.S. modeling and preparedness efforts.

Question 4. Why aren't the models very accurate?

Answer. Model accuracy depends on how much information is known versus unknown. Many variables affect where the debris will go and when, and there is no guarantee debris will stay on a predicted path. Items will sink, disperse, and break up along the way, and winds and ocean currents constantly change, making it very difficult to predict an exact date and location for the debris' arrival on our shores. Different items may also drift at different rates based on their type and composition.

NOAA has emphasized that all modeling should be considered with limitations in mind. These limitations to a computer model's effectiveness at predicting debris location and movement include: an unknown quantity (by weight) of floating debris items; an unknown composition (by material type) of debris; unknown degradation rates of materials that remain floating; and no long-term forecasts of wind and ocean currents suitable for trajectory modeling.

NOAA, in collaboration with other Federal agencies, is working to inform and improve efforts to model the movement and distribution of tsunami debris. In December 2011, NOAA formed a subject matter expert group of modelers from across NOAA line offices as well as University of Hawaii. This group works to share information on modeling approaches and data sources, and includes the leads for the University of Hawaii's Surface Currents from Diagnostic model, the NOAA Ocean Surface Current Simulator model, and the GNOME model.

Question 5. What kind of additional data or investments would it take to make the models more useful in forecasting potential debris impacts on U.S. coastlines?

Answer. To validate the model predictions, NOAA is working with its partners to gather more at-sea observations of the debris. Those observations are being collected by mariners sailing through areas of expected debris concentrations, as well as by pilots (Federal, commercial, and recreational) flying over the North Pacific Ocean. NOAA is also working with Federal and commercial partners who have access to satellite images to incorporate this satellite imagery into NOAA's ocean modeling process. NOAA is currently analyzing the results of a test conducted with the USCG and the National Geospatial Intelligence Agency to define criteria for detecting debris of different types and sizes using various satellite sensors and image analysis techniques. For example, NOAA recently led a project in Hawaii to link Unmanned Aircraft System observations with several satellites/sensors to verify the signature of floating marine debris.

COST ASSESSMENT FOR DEBRIS RESPONSE

Question 6. Can NOAA provide a low-range, mid-range and high-range of costs to respond to the tsunami debris event?

Answer. The uncertainty surrounding the nature, location and amount of tsunami marine debris that may approach the shoreline makes it difficult to estimate the potential cost of debris removal and disposal. Additionally, the type and accessibility of the shoreline will impact the cost to remove and dispose of any debris.

Using previously funded projects, and information on projects funded by other groups, NOAA analyzed the range of removal and disposal costs that may be relevant to the tsunami debris. After considering the uncertainty associated with the location and type of debris, and the variation in costs by geographic area and shoreline type, NOAA estimated that it may cost approximately \$4,300 per ton of debris.

This estimate will change as we gather more information about the size and type of debris, and whether it is approaching remote or accessible areas. This estimate also does not account for the costs to address other related issues, such as aquatic invasive species.

The removal and disposal of large debris, such as vessels and containers, are inherently much more expensive than removal of other types of debris. For example, it cost the Federal Government an estimated \$1.2 million to remove a 33-foot sailboat that washed up on a reef in Kure Atoll—a remote island in the Papahānaumokuākea Marine National Monument surrounding the Northwestern Hawaiian Islands—in 2006.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO
DAVID M. KENNEDY

NOAA'S RESPONSE TO TSUNAMI DEBRIS

Question 1. Mr. Kennedy, it has been over a year since the Japanese tsunami, and we still lack a detailed response plan. Furthermore, NOAA still does not know the size or composition of the debris. Our coastal communities have not received adequate direction for response efforts. At the March 7th NOAA Budget and Oversight

Hearing earlier this year, Dr. Lubchenco stated: "It's not yet clear that it's [tsunami debris] going to have a devastating impact by any stretch of the imagination."

There are reports of thousands of containers, chunks of Styrofoam, insulation, buoys, soccer balls, rat poison, gas cans, squid boats, and motorcycles in our waters and on our beaches. What is NOAA doing to respond and physically remove these materials from our waterways and beaches? If NOAA is not planning on removing these materials, what agency(s) are responsible?

Answer. Since the tsunami, the Interagency Marine Debris Coordinating Committee (IMDCC), chaired by NOAA, has led Federal efforts, in collaboration with State and local partners, to ensure that we are prepared to respond to this multi-year problem. The Committee has led efforts to collect and share data, assess the debris, mitigate risks to navigational and public safety, and reduce possible impacts to our natural resources and coastal communities.

On the Federal level, the IMDCC members, including USCG, EPA, Navy, Department of State, U.S. Fish and Wildlife Service, National Park Service (NPS), and FEMA have been meeting regularly to determine how to support State and local communities' clean-up efforts in a manner that best leverages Federal capabilities without duplicating efforts.

The cleanup and disposal of marine debris is normally led by the landowner, which in some cases may be the Federal or State government (*e.g.*, NPS or Oregon Department of Parks and Recreation), with Federal support as needed. However, the tsunami marine debris poses some unique challenges, and in these times of constrained budgets, impacted states have limited resources available to respond.

On the State and regional levels, NOAA's and USCG's regional coordinators are working directly with State and local agencies in affected States to develop contingency plans and ensure that the most current information is available to them. These plans include guidance and protocols for the mitigation of marine debris that pose a hazard to navigation, substantial threat of pollution, and adverse impact to public safety or health.

The USCG is responsible for addressing shoreline and at-sea debris that poses a hazard to navigation or is an oil or hazardous substance pollution risk to our EEZ, navigable waters, or adjoining shorelines. The EPA and applicable State agencies (*e.g.*, the Washington State Department of Health) are the lead agencies on radiation monitoring.

NOAA continues to work with Federal, State, and Local governments as well as nongovernmental organizations to address and respond to shoreline marine debris. NOAA is taking the lead on coordination of the overall Federal response to Japan tsunami debris, including dissemination of information to support the response. This includes but is not limited to conducting outreach to stakeholders, coordinating shoreline survey efforts, compiling debris sightings, using computer models to predict the movement of Japan tsunami debris at sea, coordinating satellite detection efforts, and providing scientific support to the USCG in their efforts to identify and mitigate hazards to navigation.

On July 16, 2012 NOAA announced that \$250,000 in grants would be made available through its marine debris program to the five States impacted by debris from the March 2011 Japan tsunami. Alaska, Washington, Oregon, California, and Hawaii will receive up to \$50,000 each to use toward marine debris removal efforts. The funds were released to the States in August.

Question 2. Numerous scientists have referenced observed increases in marine debris, and have referenced the tsunami as the likely cause. However, only few pieces have been confirmed to be tsunami debris. How do debris levels this year compare to other years? What is NOAA doing to assess how unmarked items can/cannot be linked to tsunami debris? Is it safe to say that many of the observed floats, Styrofoam, and other previously mentioned materials could be tsunami debris?

Answer. Marine debris, including Styrofoam, floats, and consumer plastics, is an everyday problem around the Pacific Rim, and therefore it is difficult to determine whether any given debris item is from the tsunami without a unique identifier, such as a serial number.

However, changes in debris composition over time may indicate an influx of tsunami debris (*e.g.*, an increase in the amount of processed lumber). NOAA is conducting shoreline monitoring in order to detect changes in the amount and composition of debris on shorelines potentially impacted by tsunami debris. The monitoring projects could also help inform future ground-truthing of debris accumulation regions, which may then be applied to models. The NOAA Marine Debris Program has been working with partners on the West Coast, Alaska, Hawaii, and British Columbia to conduct shoreline monitoring using the standardized NOAA Marine Debris Shoreline Survey Field Guide protocol. As part of this project, monitoring partners are conducting monthly surveys at shoreline sites for a period of at least two years.

There are numerous environmental and societal factors that affect shoreline debris deposition (*e.g.*, weather, tides, currents, precipitation, distance to population centers), and there is very little historical information on “normal” baseline debris abundances. As additional monitoring data is made available, it will be easier to quantitatively evaluate whether an unusual amount or composition of debris is washing ashore as a result of the tsunami.

These monitoring projects will eventually help NOAA evaluate the size of the marine debris problem, which types are most common, where it is coming from, and whether or not prevention efforts are working.

LOCAL COMMUNITY IMPACTS

Question 3. Mr. Kennedy, tourism the 4th largest industry in Washington State. In 2009, tourism contributed over \$14 billion dollars to Washington State’s economy and supported more than 143,990 jobs. Many of our coastal communities are tourism hubs and susceptible to tsunami debris. Yet, despite NOAA outreach, many communities feel that they still do not have an adequate plan in place to respond to the debris. For example, what happens when a beach goer in Long Beach, Washington—a major tourism hub in my state—finds a buoy with Japanese writing on it. The beach goer submits the sighting to NOAA’s debris e-mail address. Then, the beach goer calls 9-1-1 to ask the obvious question: “What do I do with it?”

What are Long Beach 9-1-1 operators supposed to tell community members in this situation? Please include response information for debris like Styrofoam, personal belongings, and potentially hazardous materials like gas cans.

Answer. NOAA has put together a general-guidance fact sheet to assist the public with proper protocols if they come across marine debris and potential tsunami debris: <http://marinedebris.noaa.gov/info/pdf/debrisguidelines.pdf>

NOAA encourages the public to be safe, use common sense, and follow general safety guidelines. If an item cannot be identified, it should not be touched. If it is hazardous, the appropriate authorities should be contacted as listed below.

Marine debris items or significant accumulations potentially related to the tsunami can be reported to DisasterDebris@noaa.gov with as much information as possible (including its location, the date and time the item was found, and any other relevant descriptions). It is important to remember that not all debris found on U.S. shorelines is from Japan, and NOAA is requesting that the public use discretion when reporting items.

Litter and other typical marine debris items

Examples: Plastic bottles, aluminum cans, buoys, Styrofoam

Common marine debris types may vary by location. If safe and practical, we encourage you to remove the debris and recycle as much of it as possible.

Potential hazardous materials (HAZMAT)

Examples: Oil or chemical drums, gas cans, propane tanks

Contact your local authorities (a 9-1-1 call; 2-1-1 in OR and 855-WACOAST (855-922-6278) in WA), state emergency response or environmental health agency, and the National Response Center at 1-800-424-8802 to report the item with as much information as possible. Do not touch the item or attempt to move it. Do not contact DisasterDebris@noaa.gov for response assistance.

Derelict vessel or other large debris item

Examples: Adrift fishing boat, shipping containers, docks

Contact your local authorities (a 911 call; 211 in OR and 1-855-WACOAST (1-855-922-6278) in WA), or state emergency response or environmental health agency to report the item. If the debris item is a potential hazard to navigation, immediately radio your nearest U.S. Coast Guard Sector Command Center via VHF-FM Ch. 16 or 2182 MHz or notify the U.S. Coast Guard Pacific Area Command at 510-437-3701. Do not attempt to move or remove item.

Mementos or possessions

Examples: Items with unique identifiers, names, or markings

If an item can (1) be traced back to an individual or group and (2) has personal or monetary value, it should be reported to DisasterDebris@noaa.gov. NOAA will work with local Japan consulates to determine if they can help return the item to Japan.

Question 4. Despite numerous NOAA outreach and planning meetings in and around Pacific County, communities like Long Beach still do not have the guidance they need from NOAA to both inform the community and respond to tsunami debris. What is NOAA doing to give our local communities the guidance they are calling for? And when is NOAA going to do it?

Answer. NOAA has collaborated closely with the established Washington State team to address Japan tsunami marine debris through public outreach, public meetings and presentations. NOAA is currently working with a team of State and Federal representatives to finalize the Washington Marine Debris Response Plan, which is currently being revised and is expected to be finalized as a living document in mid-September.

As stated above, NOAA has created a general guidance fact sheet to assist the public with proper protocols if they come across marine debris: <http://marinedebris.noaa.gov/info/pdf/debrisguidelines.pdf>

IDENTIFYING HIGH RISK AREAS

Question 5. Mr. Kennedy, previous research on ocean debris shows that currents and the geologic characteristics of beaches will concentrate and focus the debris. A finding I have seen shows that “half of debris will wash up on 10 percent of beaches.” This tendency for debris to wash ashore in a concentrated manner should enable NOAA to identify high risk zones for tsunami debris.

Has NOAA identified these high-risk beaches? Has NOAA evaluated the potential economic impact of debris in these high-risk areas? If not, when will NOAA do this analysis?

Answer. Though certain U.S. shorelines receive higher concentrations of debris than others due to their orientation to open ocean as well as the influence of prevailing winds and currents, there is no certainty that those beaches will receive the highest accumulation of tsunami-related debris. One way to determine areas of highest concentrations of debris deposition is through knowing what debris is stranded on beaches now and comparing those amounts to future assessments of the same beaches consistently in the future. Using this approach, NOAA is working with Federal, State, and local partners to monitor shorelines on a regular basis to identify changes in debris deposition. These changes are important to detect because marine debris washes ashore in these areas every year. Therefore, distinguishing tsunami debris that is not clearly traceable to the event in Japan from the “normal” debris that arrives constantly requires a regular measurement of debris deposition. NOAA’s research strategic plan for FY 2012–2016 identifies economic impact from marine debris as a priority topic, but it has not evaluated the economic impact of tsunami debris at this time.

Question 6. By identifying these high-risk areas, would NOAA be able to focus response efforts on these critical beaches, and maximize taxpayer dollars?

Answer. NOAA continues to work with Federal, State, and local partners on State-specific contingency plans that will allow for safe and efficient response to debris tailored to the needs of the State and local partners and the conditions present in the State. NOAA has held contingency planning workshops in Hawaii (January 2012) and Washington (April 2012), which each included representation from about 50 Federal and State agencies, counties, non-government organizations, and industry. Outputs from workshops will help guide planning in other impacted States.

Question 7. As we discussed at the hearing, creating response scenarios would allow Congress to ensure NOAA has the tools needed to respond. What resources, staff, and equipment would NOAA need to respond and remove tsunami debris in a timely manner for a high impact, medium impact, and low impact debris scenario?

Answer. There are many difficulties when trying to estimate the potential needs associated with debris removal and disposal. The quantity, distribution, composition, and timing of tsunami debris on shorelines are unknown. Different resources, staff, and equipment would be needed for different situations. For example, a large amount of debris hitting a single location over a short period of time would require different resources to remove than the same amount and type of debris washing up in the same location over a long period of time. Additionally, the type and accessibility of shoreline and type of debris will determine the resources needed to remove and dispose of debris. Large debris, such as vessels and containers, will require a different type of removal operation, expertise, permitting requirements, and associated cost structure than larger amounts of smaller debris items. NOAA continues to work with Federal, State, and local partners to refine State-specific contingency plans to prepare for scenarios.

CLEANUP GRANTS TO FISHERMEN

Question 8. The Marine Debris Reauthorization Act funds marine debris clean up grants for communities. Nonprofits, small communities, and fishermen apply for funds to clean up beaches. Mr. Kennedy, has NOAA funded tsunami debris cleanup projects through this proven grant program? Why or why not?

Answer. The NOAA Marine Debris Program typically spends a significant portion of its base budget supporting local, community-based marine debris removal projects

that benefit coastal habitats and waterways. The Program provides funds to local community-based debris removal projects, outreach and education initiatives, and annual beach cleanups every year. In FY 2012, the program awarded approximately \$875,000 to groups throughout the country, based on a competitive grant proposal process that has been underway since August 2011. The grant recipients have been notified of these awards and the funding process is underway. While these grant awards are not specifically focused on tsunami debris, this year about 42 percent of the grant funds are going to states that may be impacted by the tsunami debris.

In FY 2012, Congress provided the NOAA Marine Debris Program additional funds for projects relating to the marine debris from the Japan tsunami. NOAA is spending these funds on a number of activities, including monitoring shorelines for tsunami debris using a standardized NOAA survey and to develop rapid response protocols for appropriate cleanup of tsunami debris. Some of these funds are going to local groups to recruit volunteers and run the monitoring projects. The purpose of this project is to acquire baseline shoreline debris information ahead of the potential influx of tsunami marine debris. Baseline debris surveys will be conducted along shorelines in Alaska, California, Oregon, Washington, and the main Hawaiian Islands for a two-year period. Results of the monitoring will help indicate when and where Japan tsunami marine debris is making landfall, and will help to inform removal operations.

On July 16, 2012 NOAA announced that \$250,000 in grants would be made available through its marine debris program to the five states impacted by debris from the March 2011 Japan tsunami. Alaska, Washington, Oregon, California, and Hawaii will receive up to \$50,000 each to use toward marine debris removal efforts. The funds were released in mid-August.

Federal agencies are estimated to have collectively spent more than \$5 million in FY 2012 in response to tsunami and other marine debris along the U.S. West Coast and in Alaska and Hawaii. This spending is for activities related to monitoring, tracking, and modeling the tsunami debris; marine debris removal efforts; outreach; response coordination among Federal agencies and with States, local governments, and other stakeholders; as well as other assistance.

Question 9. A number of fishermen in Washington State apply for this grant fund in the offseason, to stay on the job and clean up debris. In Alaska, many rural communities rely on this grant funding for needed extra income. Wouldn't expanding this grant fund to target tsunami debris put cleanup groups to work on tsunami debris, fast? If NOAA was appropriated these funds from Congress, what would the turnover time be before these funds could be put to use in the community? What does NOAA need to speed up NOAA's ability to award rapid response grants?

Answer. NOAA is exploring different methods to move funds rapidly to communities for debris removal, should additional resources become available. Typically, funding is committed to external partners through the aforementioned grants process, or through contracts and cooperative agreements that require significant planning time to execute, making it difficult to respond quickly to dynamic local removal needs. NOAA is evaluating other existing grant authorities under other statutes including the Coastal Zone Management Act, Marine Protection, Research, and Sanctuaries Act, and the National Sea Grant College Program Authorization Act. Additional options being considered to provide more rapid and flexible fund distribution are 1) a mechanism to hold funds in a marine debris emergency response fund (similar to the oil spill liability trust fund under the Oil Pollution Act of 1990) and distribute them rapidly to State agencies through a non-competitive process, 2) for NOAA to contract out removal activities directly, or 3) to award funds to a prime contractor and then issue task orders to address individual problem areas.

CLEAN UP AND THE URGENCY FOR RESPONSE

Question 10. Thousands of large pieces of Styrofoam, plastics, and polystyrene have washed up on our shores. Many plastics, like polystyrene, do not biodegrade for hundreds of years. Furthermore, plastics break up into little pieces the longer it sits on the beach. This makes it much more difficult to cleanup. These little pieces of Styrofoam and polystyrene can be consumed by everything from turtles, birds, mammals, fish, and maybe even shellfish. Mr. Kennedy, What is being done to get plastics and Styrofoam off the beach as soon as it lands? How long is the average piece of tsunami Styrofoam on the beach before it is picked up by NOAA?

Answer. NOAA has initiated monitoring studies along the West Coast, Alaska, and Hawaii. Many of our partners are removing debris from beaches during each monitoring visit, in order to calculate rates of debris deposition. Plastics, including polystyrene, a synthetic polymer used to make Styrofoam, are being removed from these beaches and NOAA is encouraging local cleanup operations. However, NOAA

itself is not able to directly remove all debris from all beaches, but these monitoring results will help guide future removal efforts by State and local partners.

Determination that particular debris, such as a piece of unmarked plastic, was generated from the 2011 tsunami is extremely difficult. There is no simple way to age the plastic or determine how long it has been at-sea. Therefore, we are not able to estimate how many pieces of plastic were generated by the tsunami, how many pieces have made it to U.S. shores, or how long it sits on a beach before being removed.

Question 11. Could we apply the grant program mentioned above to rapidly deploy community members for Styrofoam cleanup? Wouldn't this be a fast and cost effective way to prevent some longer term impacts to our natural resources?

Answer. Debris collection and disposal grants can assist local communities in debris cleanup, especially on beaches with known debris concentrations. Despite the concern with the extreme persistence of plastic materials in the marine environment and its potential chemical impacts, there is no scientific evidence that polystyrene is more hazardous to wildlife or habitat than other debris materials, which may pose entanglement and ingestion risks or severe habitat damage. Therefore, rapid response is not as necessary for polystyrene as it would be for hazardous materials (e.g., petroleum, chemical waste, etc.). We recommend that removal operations concentrate on removing all types of debris, including but not limited to plastics, including polystyrene.

PROTECTED AND ENDANGERED SPECIES FUNDING

Question 12. Mr. Kennedy, there are reports of abnormally high numbers of sea turtles stranding in parts of the Eastern North Pacific. As you may know, many sea turtles migrate across the Pacific Ocean to Japan, along the path of the tsunami debris. Other highly migratory species like tuna, salmon, seabirds, and marine mammals also travel along the debris route.

What has NOAA done to assess potential impacts to turtles, fish, seabirds, and marine mammals? Is NOAA utilizing Endangered Species Act, Marine Mammal Protection Act, or other Protected Species funds to research impacts of debris on these valued marine animals?

Answer. In addition to the Marine Debris Program, NOAA is also working through its long-standing science-based surveys of marine mammals and sea turtles to observe changes in population levels in the eastern Pacific Ocean to track changes in mortality rates of endangered, threatened, or depleted species listed under the Endangered Species Act or Marine Mammal Protection Act (MMPA). However, mortality directly attributable to the tsunami is very difficult to determine based on results of these surveys. Further, NOAA is continuing to monitor stranding of sea turtles in collaboration with State agencies, local partners, and stakeholders. Although the March 11, 2011 tsunami washed 19 turtles (18 green turtles and 1 hawksbill) inland, trapping them in areas on the islands of Hawaii, Maui, Kauai, Laysan, and Midway, all but one turtle was rescued and released. The one turtle that died was found in the lava field at Kiholo Bay on the island of Hawaii. No additional observations of sea turtle strandings have been directly or indirectly attributed to the tsunami. NOAA is employing the Marine Mammal Health and Stranding Response Program, a program that was formalized by the 1992 Amendments to the MMPA, to monitor marine mammal strandings. No marine mammal strandings that have been specifically attributed to the tsunami have been observed or reported to NOAA as of this date, however, the Marine Mammal Health and Stranding Response Program continues to work with stranding networks and entanglement response networks across the U.S. Pacific waters to monitor the impacts of gear and visible marine debris. Efforts to assess entanglements with and ingestion of marine debris continue with our network partners and identification of the gear and debris will continue over the next few years. Marine mammals range widely both inside U.S. waters and across the Pacific, thereby making them susceptible to marine debris risks throughout their ranges. Many marine mammals are observed entangled in or having ingested visible debris (i.e., tires, lines, packing straps, plastic bags, parachutes) annually.

Question 13. What do we know about the potential toxic impacts of plastics, Styrofoam, and polystyrene? How will this extra material generated by the tsunami impact wildlife both at sea and on shore?

Answer. There are three aspects that cause concern in terms of plastic: it is persistent in the environment and does not easily break down; it has the capability to travel long distances, especially polymers that float and have high windage; and it interacts with the surrounding seawater to attract contaminants from the water as well as release certain chemicals used in the manufacturing process. Therefore, the primary toxicity concern is that plastic debris may introduce harmful chemicals to

remote locations and to organisms if the debris is ingested. Additional research into chemical impacts of debris is needed. One current study suggests a link between ingested plastics and increased contaminant levels (Yamashita *et al.* 2011), but overall it is very difficult to directly link plastic ingestion with increased contaminant loads. This field of research is in the early stages and most research has focused on first being able to reliably identify and quantify small pieces of plastic before then focusing on quantifying both plastic ingestion and contaminant loads in sensitive organisms.

Past NOAA-led workshops have estimated that it is unlikely that current levels of plastic debris will alter the global cycling of chemical pollutants. Research suggests that the ability of plastics to affect chemical partitioning in the air and water is very low. Without more reliable estimates of how plastics attract and release pollutants, which is likely to be highly dependent on environmental factors (*e.g.*, pH, temperature, organic carbon, etc.), NOAA cannot predict how wildlife will be affected.

It is difficult to determine exactly how the debris generated from the tsunami will impact wildlife; however, we have information on current impacts from everyday debris. Toothed whales, dolphins, and turtles are known to develop intestinal problems and/or death from ingestion of plastic bags and other marine debris and become entangled in debris such as lines, clothing, or parachutes, and pinnipeds (seals and sea lions) are known to become entangled in many types of debris, from derelict fishing gear to toilet seats. Sea turtles and some whales are particularly vulnerable to mistaking plastic bags and bits of Styrofoam for prey items or incidentally ingesting them when consuming prey, either of which can result in death. Regardless of the source of debris, it is more likely that the ingestion itself of macro-plastics will lead to acute adverse impacts and death. The secondary impact from the leaching of adhered pollutants once the material has been ingested is less likely to have an acute effect and lead directly to mortality. However, the wide extent of debris (including both macro- and micro-plastics) and the likelihood of incidental ingestion on a frequent basis in some areas may increase concerns about the possibilities of chronic effects associated with the plastics themselves. Marine debris is widely dispersed but may aggregate in certain areas or at certain water depths and pose a risk for animals feeding or swimming in those areas. For some critically endangered species such as the Hawaiian monk seal, marine debris may be a significant threat as currents may transport debris to important foraging habitats for these small populations.

As debris approaches the coast, the risk of entanglements of or ingestion by individual whales, dolphins, sea turtles, and pinnipeds may become more apparent. In this scenario, the stranding/entanglement response and health assessment programs would enable quantification and types of impacts from examination of stranded, entangled, live captured and by-caught animals.

HIGH FREQUENCY RADAR COVERAGE

Question 14. NOAA installed high frequency radar systems along much of the United States coastline. These radar systems measure the speed and direction of ocean currents. This data has important applications for search and rescue, fisheries modeling, oil spill response, and even modeling currents used to model debris trajectory. However, there is only one radar station installed in Washington State, leaving much of coast without coverage.

Mr. Kennedy, Washington State is slated to bear the brunt of the debris from the tsunami; however, Washington State has poor high density radar coverage. Does NOAA plan to install high density radar along Washington's coast? Would improving our understanding of near shore currents improve NOAA's ability to predict beaches that would experience heightened debris levels?

Answer. The President's FY 2013 Budget for NOAA's U.S. Integrated Ocean Observing System program supports the operations and maintenance of existing radars across the United States. NOAA does not plan to install new HF radar along the Washington coast at this time.

While additional HF radar coverage would add to the information used to initialize models, it is not expected that this addition would directly result in an improved ability to predict debris concentrations. The largest source of uncertainty in models is based on the need for additional information on the composition and distribution (location) of the debris. HF radar does not have the ability to directly detect drifting debris, since the debris blends with the currents that carry it.

HF radar provides the capability to measure currents in real-time, but it cannot predict currents into the future. In order to predict currents, real-time current data would need to be integrated into a forecast model which does not presently exist in operational form. NOAA has been informed that Oregon State University will be

extending its near-shore model to the mouth of the Strait of Juan de Fuca by the end of 2012. However, even with this model or another similar model, the currents would only be forecast 2–3 days in advance. This short term forecast could be helpful for using NOAA models to create trajectories of individual objects, but not in predicting debris deposition across a wide area over a long period of time, which is an important issue for response planning.

To support response planning, NOAA is working with Federal, State, and local partners to implement monitoring sites where standardized data are collected on a regular basis to identify changes in debris deposition. Identifying these changes is important because marine debris washes ashore in these areas every year. Distinguishing tsunami debris that is not clearly traceable to the event from “normal” debris that arrives constantly requires a consistent awareness and measurement of debris deposition.

DEPARTMENT OF DEFENSE DATA

Question 15. The Department of Homeland Security has high quality satellite imaging data. And I understand the C.I.A. has mobilized this data for the scientific community in a safe and secure manner through the Medea Program in the past. NOAA currently collaborates with the Coast Guard and Department of Defense to a small degree, to obtain at-sea debris sightings.

Mr. Kennedy, what other cost saving collaborations have you have established. For example, does NOAA have an agreement with the Department of Defense or the Department of Homeland Security to obtain flyover, satellite, or other at-sea sighting data, which could help us better understand the tsunami debris? Has that data been made available to academic researchers with the appropriate security credentials? Are there additional data sources that would be helpful tools for NOAA’s tsunami debris analysis?

Answer. Prior to the Japan tsunami, there were very few attempts to employ satellite analysis of open ocean waters to detect and track floating marine debris. NOAA is working with partners in the USCG and the National Geospatial Intelligence Agency to define criteria for detecting debris of different types and sizes using various satellite sensors and image analysis techniques. For example, NOAA recently led a project in Hawaii to link Unmanned Aircraft System observations with several satellites/sensors to verify the signature of floating marine debris.

There are many challenges associated with detecting debris on the open ocean, including simple constraints such as clouds that block the satellites view of areas of interest to more complicated constraints, such as knowing where to tell the satellites to focus their sensors over the large ocean area. NOAA continues ongoing discussions with Federal partners on expansion of debris detection efforts into an overall sampling strategy which would better inform debris modeling and assessment efforts.

NOAA continues to analyze available high-resolution satellite imagery to better evaluate anomalies noted in recent images; however, there are areas where improved data access, data analysis and interpretation could enhance our ability to detect, track, and forecast the movement of tsunami debris. These areas include: imagery analysis support to conduct image post-processing and image interpretation; computer time/power to perform advanced satellite imagery analysis; and resources to increase the number of studies to verify satellite recognition of confirmed debris sightings.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. AMY KLOBUCHAR TO
DAVID M. KENNEDY

MITIGATING IMPACTS FROM MARINE DEBRIS

Question. When marine debris sinks to the bottom, some might say out of sight, out of mind. But certain kinds of debris can destroy underwater habitat. Near Duluth, Minnesota, wood debris from sawmills a century ago is only now being removed from the St. Louis Estuary, with funding from the Great Lakes Restoration Initiative, the National Oceanic and Atmospheric Administration (NOAA) Restoration Center, and the State of Minnesota Legacy Amendment. This sunken debris has prevented fish and vegetation from reclaiming the site for over 100 years.

In areas where significant amounts of debris will accumulate and sink, either in the Great Lakes or off the West Coast, what can be done to prevent underwater habitat destruction?

Answer. Environmental models predict certain accumulation zones for tsunami debris in waters off the West Coast. However, much uncertainty exists in these models and it is difficult to ground-truth them to find true hotspots of marine debris

accumulation because observations of floating and sunken debris are scarce. In previous projects, sunken debris has been identified through means of scanning or multibeam sonar and has been removed using the most ecologically-sensitive methods to avoid further destruction of underwater habitat. Because the tsunami debris is currently so dispersed, we are not able to implement a catchment system for debris as it washes ashore and will be reliant on identification and removal mechanisms if debris hotspots form on the West Coast. In other locations that do not involve debris loads generated by natural hazards, NOAA and EPA focus on outreach and education to prevent terrestrial litter from becoming marine debris as the best strategy at preventing damaging impacts to habitat and marine species.

The project outlined by Senator Klobuchar presents a good example of the benefits of removal. The removal of marine debris and restoration of Radio Tower Bay was one of nine habitat restoration projects awarded in 2010 by the NOAA Restoration Center. This project funds the Minnesota Department of Natural Resources to remove marine debris in the form of derelict pilings and historic sawmill waste and is expected to improve submerged vegetation and habitat for fish, macro-invertebrates, and other aquatic organisms within this Great Lakes Area of Concern. The project provides important spawning habitat for regionally important migratory fish species (e.g., lake sturgeon, walleye, and longnose Sucker) as well as other important resident species. Once removed, debris is not expected to re-accumulate or create further habitat injuries as modern sawmills are much more efficient and recycle most waste products. Removal and restoration continues, but to date approximately 146 metric tons of debris has been removed.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOHN D. ROCKEFELLER IV
TO REAR ADMIRAL CARI B. THOMAS

Question 1. Admiral Thomas, can you describe for me how the Coast Guard coordinates with the Army Corps of Engineers to remove marine debris that poses a hazard to our waterways?

Answer. Marine debris that rises to the attention of Coast Guard and the Army Corps of Engineers is normally associated with an abandoned floating or grounded vessel. For non-Stafford Act activities, the Coast Guard's interactions with the Army Corps of Engineers regarding marine debris that create an obstruction to U.S. waterways are governed by a Coast Guard/Army Corps of Engineers Memorandum of Agreement.

In cases where an obstruction poses a threat to navigation, obstructs a navigable channel, or endangers protected or sensitive habitat, and so long as the obstruction does not pose a pollution threat (or the pollution has been mitigated) the Coast Guard coordinates with the Army Corps of Engineers, and state and local program managers to address the obstruction. A joint determination that the obstruction poses a threat to navigation is made between the appropriate Army Corps of Engineers District Engineer and the Coast Guard District Commander. This determination is based on several factors, such as: location of the obstruction and depth of water; physical characteristics and possible movement of the obstruction; and commercial and recreational traffic in the vicinity of the obstruction. If there is a joint determination that the obstruction poses a threat to navigation, the threat is mitigated or removed through a number of possible actions: the Coast Guard may order the owner to mark it with a buoy if it is grounded; the Army Corps of Engineers may require the owner to remove the obstruction; or the Army Corps of Engineers may remove it themselves under their own authority.

Question 2. Admiral Thomas, the Coast Guard plays an important role in preventing marine debris from entering our oceans, by inspecting vessels entering U.S. ports for environmental compliance so garbage does not enter the marine environment. Can you describe how the Coast Guard enforces MARPOL Annex V?

Answer. The Coast Guard enforces MARPOL Annex V requirements during scheduled inspection and examinations or during targeted examinations if there is reason to believe there is a violation of the requirements found within MARPOL Annex V. The Coast Guard will examine a garbage log to ensure owners and operators are logging discharge of garbage, as well as verify proper separation and handling of garbage through visual inspection. The Coast Guard also questions crew members on garbage handling procedures to ensure they are familiar with the MARPOL requirements.

Question 3. How can enforcement of MARPOL Annex V be improved?

Answer. Working through the International Maritime Organization, the Parties to MARPOL Annex V recently amended it to further restrict the types of garbage that may be discharged overboard, and these amendments will enter into force on Janu-

ary 1, 2013. The U.S. Coast Guard is in the process of updating its regulations to maintain consistency with the changes in MARPOL Annex V. As the regulations are updated, the Coast Guard will examine our inspection procedures and evaluate ways to improve enforcement with the new regulations. Enforcement options available to the Coast Guard for vessels found not in compliance with Annex V include: notices of violation; civil penalties; operational controls (detaining the vessel in port or denying entry to U.S. waters); and criminal prosecution.

Question 4. Rear Admiral Thomas, although this is not the central topic of today's hearing, I wanted to take this opportunity to ask the Coast Guard a few questions about discharges by vessels of garbage and other discharges incidental to the normal operation of vessels. In addition to the marine debris that can be generated by tsunamis when they hit coastal communities, ocean-going vessels also are a significant source of garbage and debris. This Committee held a hearing in March, at which the Coast Guard testified, on regulation and oversight of the cruise line industry. In preparing for that hearing, I was shocked to learn that an estimated 25 percent of the plastic bottles and other garbage we find in our oceans is generated by cruise ships. The Act to Prevent Pollution from Ships, and regulations issued by the Coast Guard thereunder implementing MARPOL Annex V, prohibit the discharge of garbage within 3 nautical miles of our shores. They also impose a more stringent no-discharge zone of 12 nautical miles for certain types of garbage, and prohibit any discharge of plastic. Notwithstanding these prohibitions, the EPA in its 2008 Cruise Ship Discharge Assessment Report indicated that discharges of solid waste and plastic from cruise ships still occur.

From the Coast Guard's perspective, are our current laws governing the discharge of garbage from cruise ships and other vessels adequate to address this problem?

Answer. The Act to Prevent Pollution from Ships gives the U.S. Coast Guard the authority to develop regulations and enforce MARPOL Annex V, which regulates the discharge of garbage (including plastics) from ships. The act applies to all U.S. flag ships anywhere in the world and to foreign flag vessels operating in waters under U.S. jurisdiction or while at a port or terminal under U.S. jurisdiction. The act also establishes regulations for operational discharges of wastes from vessels. From the perspective of the Coast Guard's vessel inspection and Port State Control programs, this law governing the discharge of garbage from cruise ships and other vessels is adequate.

Question 5. Is the IMO looking at this issue at all, or are the current requirements under Annex V the best we can do?

Answer. Parties to MARPOL Annex V recently examined these issues, and adopted amendments to the Annex through the International Maritime Organization's Marine Environmental Protection Committee (MEPC) in July 2011. These amendments will enter into force on January 1, 2013.

Before these Annex V amendments, discharge into the sea of substances defined as "garbage" was allowed unless specifically limited or prohibited under Annex V. Among other technical changes, these Annex V amendments reduce the types of "garbage" that can be discharged into the sea by establishing a general prohibition on discharges of garbage into the sea with limited exceptions. Examples of these exceptions are, in rough terms, that food wastes processed by a grinder may be discharged in most areas at least three miles from land; that unground food wastes may be discharged in most areas at least 12 miles from land; and that cargo residues not harmful to the environment may be discharged in most areas at least 12 miles from land.

Thus, Annex V as amended will continue to greatly restrict the discharge of garbage into the sea. Annex V will also continue to require garbage management for ships. The Act to Prevent Pollution from Ships authorizes the Coast Guard to implement and enforce Annex V, including any amendments to it that enter into force for the United States. The domestic regulations implementing Annex V are located in 33 C.F.R. Part 151, subpart A. As the United States is a Party to MARPOL Annex V, we are currently revising these domestic regulations to reflect the recent Annex V amendments.

Question 6. Rear Admiral Thomas, beyond discharges of solid waste by vessels, many of us on this Committee are very troubled by the current regulatory framework governing discharges of ballast water and other discharges incidental to the normal operation of vessels, such as bilge water, deck run-off, and so forth. As a result of environmental litigation in the mid-2000s, in which a roughly 35 year old regulatory exemption for vessels from certain requirements of the Clean Water Act was overturned, we now have a confusing, duplicative, and inconsistent patchwork in which the Coast Guard, EPA, and individual States are all regulating these same vessel discharges in highly inefficient and sometimes even contradictory ways.

Wouldn't it be better for the marine environment, maritime commercial interests, the Coast Guard as America's Federal maritime law enforcement authority, and most of all the American taxpayer, to have a single, simple, clear, and consistent framework for the regulation of all discharges that are common to the normal operation of vessels?

Answer. The Coast Guard believes the current statutory framework for ballast water discharges can be effective in minimizing the risk of introduction and spread of aquatic nuisance species via ballast water discharges. The Coast Guard continues its work with the EPA and the States to ensure that the agencies' efforts to manage such discharges under our current authorities are as coordinated, consistent, and transparent as possible.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARK BEGICH TO
REAR ADMIRAL CARI B. THOMAS

Question 1. Admiral Thomas, some small percentage of the debris is likely to be hazardous substances. Even though it is a small percentage, a small percent of 1.5 million tons is still a lot of hazardous substances. Does the National Contingency Plan consider these sorts of high volume but highly-dispersed events that this debris is likely to present?

Answer. Yes. The Coast Guard Federal On Scene Coordinators, in coordination with Federal, state, local and tribal officials as well as the private sector, have established Area Committees around the entire U.S. coastline. These Area Committees plan strategies for effective government and private sector response to incidents of various types whenever they occur in support of the National Contingency Plan. The Area Committees are supported at the regional level by 13 Regional Response Teams (RRTs). These Federal, state and tribal bodies support detailed area plans and are able to cascade in additional resources if the capability of one or more local areas is exceeded.

Question 2. How does the Coast Guard execute its Federal On-Scene Coordination roles in such events, where many hazardous substances are highly dispersed, and in remote areas?

Answer. The Coast Guard's execution of its Federal On Scene Coordinator (FOSC) role is outlined in the National Contingency Plan (NCP) and does not change based on remote location or quantity of hazardous substances. As the pre-designated FOSC in the Coastal Zone, the Coast Guard coordinates (and when appropriate directs) spill response resources to locations in accordance with Area Contingency Plans (ACPs). ACPs, which represent pollution response planning at the local level, contain site-specific response strategies, identify areas of economic and environmental importance, and contain a description of the equipment, personnel, and resources available for effective removal of oil and hazardous substances.

Question 3. What should people do if they find suspected hazardous substances in the maritime environment?

Answer. If someone finds a suspected hazardous substance, either on land or in the maritime environment, they should not touch, handle, or make any attempt to move or clean it up. They should immediately contact the National Response Center (1-800-424-8802 or via the Internet at <http://www.nrc.uscg.mil/nrchp.html>) or 9-1-1. Since the 1970s the National Response Center (NRC) has served as the Nation's emergency call center for reporting actual or suspected hazardous material spill incidents anywhere in the U.S. Located at the U.S. Coast Guard Headquarters, the NRC is a 24 hr X 7 day a week operation. When it receives a call, the NRC immediately provides notification to the appropriate U.S. Coast Guard and Environmental Protection Agency response officials that are closest to the location of the reported incident. These officials then coordinate with management officials to affect response.

Question 4. Will the Coast Guard be able to respond to all of these reports of hazardous substances in remote areas? Do you have the resources to do that?

Answer. Yes. Remote areas are very challenging from a response perspective, often requiring an interagency solution to prevent and mitigate the risks.

As Federal On-Scene Coordinator (FOSC) in the coastal zone, the Coast Guard, in coordination with Federal, state, local and tribal officials and the private sector, plans for such responses locally, regionally, and nationally. In the United States, response to hazardous materials incidents is a shared government and industry capability. Federal, state, and local responders are equipped and trained to respond to and mitigate immediate threats to human health and safety by securing the source, if possible, and evacuating the population at immediate risk.

The Coast Guard, as FOSC, in cooperation with state, local, and tribal officials, will ensure the immediate threat is mitigated. If there is no responsible party immediately available to fund the response, the FOSC will access the Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA) fund to hire private sector response organizations for cleanup. The Coast Guard has Basic Ordering Agreements in place with private sector response organizations nationwide to ensure our capability to respond.

The Coast Guard has access to several special teams under the National Response System, including the National Strike Force. The Coast Guard also has aircraft, boats, and cutters that are positioned to assess and respond in remote areas.

